THE OIL AND GAS JOURNAL

THE OIL INVESTORS' JOURNAL

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THE WORLD'S PETROLEUM PRODUCTION IN 1910.

This issue of THE JOURNAL, which is largely a review of petroleum operations in the United States, Mexico and Canada during 1910, with some reference to foreign fields, including much statistical matter, while not quite so copious as the publishers may have hoped for at the outset, covers some developments in petroleum and natural gas not heretofore treated in previous publications, at least they did not cover authentically so large an area. The editors have been very courteously treated by the individuals, companies and authorities from which special and general data have been sought and desire to express the appreciation they feel in every instance. It is easy to write entertainingly, and even instructively, about the petroleum industry, but it is not so easy to be directly specific in every statement and essentially accurate as to computations and comparisons that involve hundreds of figures and technical facts that must be secured from many sources, and the attempt to be accurate, concise and intelligible must necessarily be at the expense of running narrative. This publication is the first attempt to furnish exact statistics and data of all producing districts for the same year, from New York and Pennsylvania, through Illinois to Oklahoma and on to the Texas and Louisiana fields, including a fleeting view of Colorado, Wyoming and Utah, in reaching California, and a month of collaboration and computation may well lead to a headache. It is well within the possible that mistakes may have crept into some of the tables, or their totals, that may be, here and there, discovered by some individual thoroughly conversant with his own locality, but as a statistical reference and a comprehensive review of the petroleum industry it is believed that it will serve its purpose. A publication purely local to one field can easily include in its circumscribed area a large amount of detail interesting to the local readers, garnished with personal sketches and human interest flashes, but if the same verboseness was maintained in every district for a complete issue it would swell into volumes and would necessitate so many writers and sketch gatherers and the expenditure of so much money that the attempt might easily, if not probably, result in failure. THE JOURNAL is not a human-interest story paper and is therefore forced to confine itself to fact and specific statement. But even so, when the wonderful expansion and progress that came to the petroleum industry last year are considered in the abbreviated history here presented, there is much of human interest and commercial picturesqueness to hold the serious reader and leave a desire to read the continuation of a great industrial serial when it appears a twelvemonth hence.

The official figures are almost astounding, being 216,588,368 barrels—nearly 12,000,000 barrels in excess of what was accepted previously. The totals, by grand divisions and grades, are:

	1910	1909
Pennsylvania	26,557,079	26,535,844
Lima-Indiana	6,671,684	8,211,443
Kentucky	473,526	518,299
Illinois	32,984,736	30,898,339
Mid-Continent	59,032,333	49,804,922
Gulf Coast	12,823,440	11,912,058
California	77,697,568	54,433,010
Colorado, Wyoming and others	847,000	338,658
Total	216,588,308	182,134,274
Increase in 1910		34,454,034

In only four of the principal producing regions of the United States did production decrease, and in those the decline was moderate. In the Appalachian region, producing the Pennsylvania grade of crude (including New York, Pennsylvania, West Virginia, southeastern Ohio and Kentucky), there was a loss of only 200,539 barrels; the loss in Lima-Indiana field was the heaviest, 1,474,544 barrels. Illinois shows an increase of 2,686,397 barrels in 1910, which will prove something of a surprise to many persons, as the impression prevailed, at least up to the beginning of 1911, when field statistics began to appear, that that field had declined.

What seems to be the most phenomenal increase during the year is in the Mid-Continent fields, embracing Oklahoma, Kansas, Caddo, in northwestern Louisiana, Corsicana in central and Petrolia in northern Texas, the total production of which in 1909 was reported by the Geological Survey at 49,804,922 barrels, but in 1910 it is reported at 59,032,333 barrels, an increase of 9,227,411 barrels. Of this added production Oklahoma furnished in 1910 about 5,000,000 barrels and Caddo about 4,000,000 barrels, Oklahoma and Kansas in 1910 being credited with something over 49,000,000 barrels, as against as much over 44,000,000 barrels in 1909. In 1910 Caddo produced 6,390,000 barrels and about 2,225,000 barrels in 1910. In 1910 Corsicana, Powell and Petrolia produced 525,843 barrels, in 1909, 491,805 barrels, an increase of 34,038 barrels. The light-oil district at Corsicana produced in 1910, 132,706 barrels, a decline from 1909, when the production was 146,905 barrels, of 14,199 barrels, but the heavy-oil field at Powell produced 270,105 barrels in 1910, against 233,037 barrels in 1909, an increase of 37,068 barrels during the year. With a production of 123,706 barrels in 1910 and 111,863 barrels in 1909 Petrolia shows an increase of 11,843 barrels.

The Gulf Region in 1910 made a decent comeback, the production being given at 12,823,440 barrels, while in 1909 it was 11,206,464 barrels, showing an increase of 1,616,976 barrels. Late in the year, after a considerable falling off from the previous year's output had occurred, Vinton, in Louisiana, and Markham, in Texas, offered a few near-gushers to turn the totals into an increase, assisted somewhat by a little spurt late in the summer at Sour Lake.

Of course the world must toss its bouquets to California, with its 77,697,568 barrels in 1910, an increase over 1909 of 23,264,558 barrels—a marvel; and even at that one-third of the increase was furnished by one well that came in, produced 8,000,000 barrels and died all in the short space of about eight months. It is altogether probable that half a dozen—not to exceed a dozen certainly—other gushers made up the rest of the enormous increase. So incomprehensible to the ordinary person are these remarkable figures that California writers have lost their petroleum bearings and are predicting for 1911 a production in that State alone of 100,000,000 barrels and all of it consumed as fast as produced. Presuming that a few other spots on the globe will increase somewhat also, Mexico, for instance, the California newspapers would have the population swimming in crude oil, regardless of the price or prosperity. As it is, studying these figures, the wonder is that the prices of crude and refined products have held so steady, with stocks of 100,000,000 barrels that are paying storage charges until new uses can be found for it.

Dr. Day's figures and estimates for the world's production of crude petroleum in 1909 are 297,413,791 barrels, which was a world's record, but for 1910, taking the 216,588,368 barrels produced in the United States for a starter and adding 7,000,000 barrels increased production for all foreign countries over 1909, when the foreign production was 117,000,000 barrels—making that for 1910, 124,000,000 barrels—we have the grand total of 340,588,368 barrels as the world's output of crude oil in 1910, almost a million barrels a day. This is taking the government's figures for both years and for comparison, and the director has been to unusual pains to communicate with individual producers, pipe line companies, refiners, shippers and consumers in all parts of the United States. For general statistical purposes the government figures must be taken for comparisons. And the fear that they may be overly high is somewhat allayed by the knowledge that in one field alone in 1909, California, the Geological Survey figures were 3,000,000 barrels below those given by the State Mining Bureau. If we have read the figures aright and made the correct computations from advance copies of the 1910 report, there is enough oil for all, as Commodore Schley said about the glory found skylarking around Cuba—also Colonel Roosevelt, not to overlook any one or anything.

PRODUCTION FOR NINE YEARS.

In the following table will be found the total production of petroleum of all the oil producing countries of the world, from the year 1902 to 1910, inclusive, in barrels of 42 gallons each:

COUNTRY.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
United States	88,766,916	100,461,337	117,080,960	134,717,580	126,493,936	166,095,335	179,572,479	182,134,274	216,588,368
Russia	80,540,045	75,591,356	78,536,655	54,960,270	59,043,829	61,850,734	62,126,447	65,970,350	66,000,000
Sumatra, Java, Borneo	5,860,000	6,640,000	6,316,109	7,334,310	7,399,024	8,377,099	8,752,822	11,041,852	15,000,000
Galicia	4,142,159	5,234,475	5,947,383	5,765,317	5,467,967	8,455,841	12,612,295	14,932,799	11,000,000
Roumania	2,059,935	2,234,475	3,599,026	4,420,987	6,378,184	8,118,207	8,252,157	9,321,138	9,500,000
India	1,617,363	2,510,250	3,385,408	4,137,098	4,015,803	4,344,162	5,047,038	6,676,517	7,500,000
Japan	1,193,038	1,209,371	1,418,767	1,341,157	a 1,341,159	2,010,639	2,070,929	2,012,409	2,000,000
Mexico	.....	.....	.....	.....	1,000,000	1,000,000	3,481,410	2,488,742	4,000,000
Canada	530,624	486,637	552,575	634,095	569,753	788,872	527,987	420,755	1,000,000
Germany	353,674	445,818	637,431	560,963	579,101	756,631	1,009,278	1,018,837	1,000,000
Peru	59,274	49,048	49,524	37,720	42,419	741,226	1,011,180	1,316,118	400,000
All Others	44,933	47,876	65,476	74,027	a 80,000	89,875	a 90,000	80,000	1,400,000
Total	185,167,961	194,910,643	217,589,314	213,983,524	212,411,174	262,628,621	284,614,022	297,413,791	335,388,368

a Estimated.

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The Gasoline From Natural Gas Industry

Perhaps no more interesting feature of the petroleum and natural gas industry has ever appeared than the one involving the transmutation of commercial gasoline from the gas that comes from producing oil wells, and the year 1910 will begin the practical era of its general utilization. It has come to be an intensely interesting problem, both from its financial and scientific importance, through the bearing it must have upon the future prosperity and pecuniary success of oil producers throughout the oil fields of the world. Even after the installation over an extensive area of practical and successful plants, this new industry is quite a mystery to most producers, but they are becoming greatly interested and are beginning to watch the developments and to make inquiries that will permit them to take advantage of what promises to add largely to their incomes and also to a much greater profitable longevity of oil wells that have dwindled almost to the abandonment stage. THE OIL AND GAS JOURNAL has been interested and impressed with this new gasoline industry from the start, and has endeavored to gain more intimate knowledge of the mechanical installations and the commercial features, that it can more intelligently and satisfactorily provide its readers with the information they are seeking. It is proper to state, at the outset, that the collaboration of data covering the casing-head gas gasoline industry is not easy or completely satisfying, but we have been able to present several papers prepared by men who are engaged in the manufacture of the mechanical devices and the installation of the several processes and methods now on the market or about to be offered for the inspection of producers.

Frank P. Peterson, mechanical expert for the Bessemer Gas Engine Company, Grove City, Pa., furnishes THE JOURNAL with an interesting review of progress and possibilities of the industry, from the viewpoint of successful installation and scientific investigation. Douglas W. Franchot, the active manager for the D. W. Franchot & Company process and appliances, also furnishes us with some practical ideas relating to the liquifying processes. We have also been kindly furnished with condensed data obtained after careful investigation by a gentleman for the enlightenment of the United States Bureau of Mines, a new department of the United States Geological Survey. For personal reasons, the gentleman does not desire publicity, but the object sought is accomplished just as well. THE JOURNAL, we may be permitted to say without undue egoism and blowing of our own horn, is the only publication treating exclusively of petroleum and natural gas that has seriously and consecutively undertaken to throw light upon this intensely interesting problem, and may justly be entitled to claim the honor of being the pioneer publicity agent. We are personally interested in the industry to discover all that can be offered to the reading public and will continue to search for facts that oil and gas producers are craving for. We will undertake to personally investigate matters pertaining to inquiries from persons desirous of utilizing any of the differing processes and mechanical devices for liquifying the escaping and now largely wasted gas originating in all wells producing high grade oil—not as a professed expert, however, but as the purveyor of information.

For many years individuals in the older oil-producing regions have carried on a profitable business collecting gasoline drips from natural gas lines in the winter months. One man collects 850 gallons of 79 gravity gasoline a day, and numbers of men unfitted for the laborious work in oil fields make a living collecting these drips. Several natural gas distributers have installed plants that accelerate the precipitation of gasoline and derive much profit from its sale. These facts have been known, in a general way, but it is only within the year that oil producers have awakened to the possibilities in the nearly exhausted fields, where a volume of 30,000 cubic feet of gas can be turned into a profit for itself and also another profit obtained through the ability to pump wells that, without the gasoline profit, would have to be abandoned and wholly lost.

The gasoline from gas industry really had its inception in 1907 at Bradford, Pa., where Mr. Hollingshead made the first attempt and is familiar with its early history. Wells in the Bradford field were flowed with air pressure, but it was found that the air and salt water combined to produce an undesirable chemical action on the casing. To eliminate this feature gas was substituted for air, but successful operation of the wells was interfered with by the quantities of gasoline generated by the high pressure. The elimination of this handicap in turn led to the installation of devices for the separate accumulation of the liquified gas, or gasoline.

The industry had progressed no further than this movement at Bradford until, in the fall of 1909, a plant was installed at Bolivar, N. Y., and another at Maysville, Pa. During 1910 considerable activity prevailed and it became a commercial success. The Bessemer gas engine people were, perhaps, more prominent in the work throughout the various fields than others, and in the late months of 1910 the office force of that company organized the Penn Gasoline Company at Grove City, Pa. The Bessemer company, through Mr. Peterson, has for months been circulating results thus obtained and added greatly to the publicity.

Because a few plants have made what seemed to be fabulous profits from casing-head gasoline other persons have jumped to conclusions and discovered, after counting the losses entailed, that the gas employed was unfit for such use, lacking the ingredients to produce results. At least twenty-five failures resulted in this way that might have been avoided by preliminary investigation. In preparing for this industry it is absolutely essential to determine the character of the gas sought to be utilized, for natural gas differs materially in individual wells and in contiguous areas and leases. Dry gas is worthless for gasoline distillation or precipitation. It is only the gas that rises directly from crude oil in the wells that yields gasoline under compression and condensation, and it must be enriched by the hydro-carbons supplied by the oil.

One Pennsylvania firm has ten or twelve plants in operation and produces around 5,000 gallons of gasoline a day, the business running to about $20,000 a month, the profits largely going to extend the work on a larger scale. It is almost impossible to secure any information about this firm's methods. The Penn Gasoline Company, mentioned above, has five plants in operation, and is installing twelve more. The Reno Oil Company, of Sistersville, W. Va., has four very profitable plants. The Standard Oil Company has six plants running and turns out 35,000 gallons of gasoline a month. The Standard people incline to the belief that the possibilities of the industry are limited, fixing a maximum of 50,000 gallons a month as the capacity of their eastern oil-producing properties. They are very methodical and careful about the operations, but are very liberal in comparing notes with other operators. These plants represent the big producers to date, but many individuals have plants in successful operation and hundreds are planning to install them in the spring.

Estimated Production.

A rough estimate of the total output at this writing of gasoline from gas is 13,000 gallons a day, from about 70 plants involving an investment of $250,000, and practically all of it done in the last five months of 1910. The gasoline thus produced nets 9 to 11 cents a gallon. The industry is of course very much in the experimental stage, with many operators, as they become familiar with the processes and machinery, eliminating waste and expense and increasing their output. It is reasonable to believe that by the close of 1911 the production will have reached to 50,000 gallons a day.

Geographical Distribution.

Bolivar, N. Y., is the northern limit of gasoline production and Wayne county, Kentucky, is the southern limit, in the Eastern fields, but there is a plant in experimental operation in the Caddo field in Northwestern Louisiana. The two richest districts are Sistersville, W. Va., and the old McDonald field in Pennsylvania. Maysville, in Warren county, and Chicora and Petrolia, in Butler county, Pennsylvania, are important centers of operation. However, one or two plants may be seen in almost every community throughout the oil producing regions. In Illinois three plants are about to begin, and in Oklahoma nine plants, with three makes, are either in operation or in process of construction, in the Okmulgee, Muskogee, Glenn Pool, Bartlesville and Alluwe districts, and during this year a number of others will be installed, as casing-head gas in many Oklahoma districts is very desirable, and the industry promises to become an important feature of the petroleum industry in that State. Kansas presents an especially promising field for gasoline manufacture and seems to be the salvation for producers there to break even in their oil investments. Tests made at Boulder, Colo., promise well. West Virginia will undoubtedly profit greater from natural gasoline than any other State.

Production Per Cent.

The richest gas produces eight gallons per 1,000 cubic feet, but the average is three to three and one-half gallons. The gravity ranges from 85 to 95 degrees in the Eastern fields, but in the lower grade fields in the West it may be as low as 65 degrees, the gravity of the product being governed to some extent by the specific gravity of the crude from which the gas comes. This point is best illustrated, perhaps, by the statement that Oklahoma crude, when it finally reaches the refineries, now produces gasoline of a gravity no higher than 62.5 degrees, indicating clearly the loss of a considerable per cent of the volatile ingredients that the crude possesses fresh from the well and also from the first wells drilled in a new field. The crude oil now produced from wells in the Oklahoma districts first opened and continuously developed has depreciated in specific gravity, in some places several degrees, through the continued release and evaporation of the gas—the naphthas and gasoline-forming ingredients. This statement is subject to the modification, according to the experience of some producers, that for producing gasoline from casing-head gas the older wells with small production appear to be richer than new wells, at least in the old Eastern fields, where the paraffin oil is undoubtedly much richer in gasoline than the oil found in the Western fields. The per cent of naphtha held in natural and normal suspension in any crude oil can not be artificially increased by mechanical devices, nor can its normal specific gravity be increased in the refining processes, according to the statements of practical refiners. This again may be modified when considering gasoline formed by natural refrigeration or by the processes of compression as used in the industry under discussion, for at least one of the firms now in the market offers to produce gasoline up to 105 degrees gravity. Gasoline of that extreme gravity, however, can not be used in ordinary ways because of its volatility and quick evaporaiton. Above 95 degrees it is difficult to retain in containers or to handle for common uses.

Ordinarily the color of compression gasoline is a clear, sparkling white, but may sometimes have a slight greenish tinge, caused by the lubricant used in the gas pumps or the compressor. The odor is quite rank and it effervesces from the bottom like champagne when warm. It is said to carbonize a motor, but close scrutiny might reveal the presence of a poor quality of low gravity naphtha, 54 to 58 degrees, or even kerosene, compounded to reduce the gravity, which is regularly done now by refineries to meet the increasing

demand for motor and internal combustion gasoline, it having been stated by well-informed persons that the bulk of the motor gasoline now in use is 62 degrees and under, to as low as 52 gravity, with constant efforts to produce motors and engines that will work on a fluid that almost meets the best kerosene tests. The owner of one gasoline from gas process says that nothing under 86 degrees comes from his plants. In one or two plants in operation it is claimed that the product is as low as 62 gravity, which conforms to the refiners experience.

To What Uses Put.

Gasoline from gas is used for compounding with low gravity refinery naphthas and gasoline, for use in automobiles, something that has not yet been successfully worked out, although thousands of gallons of gas gasoline are sold to the automobile trade. The mixture is not homogeneous, as contended by some, as the lighter gas gasoline, obtained by compression, rises to the top in its own stratum when mixed with the refinery product. Several refiners claim to have secured good results by distillation, thus fixing the suspension. Much of the gas gasoline is shipped for use in lighting and heating systems. Farmers living in places where this gasoline is produced can have ideal light at little expense, by the use of a simple generator and hollow wire tubing. A personal canvass of refineries reveals the fact that they are refusing to manufacture any more high gravity gasoline and it is almost certain that every year will develop a lowering in gravity. About 68 degrees may be accepted as the future maximum gravity limit, with an average of 62 to 63 degrees. This will deteriorate the quality, for both ends are involved in the distillation. The enormous increase in the consumption of refinery gasoline and the startling increase in the quantity exported in recent years will force the casing-head gasoline industry to be seriously studied by economists as a public benefit.

The market for the product has not yet been successfully established, and some oil producers hesitate to embark in it for that reason. One of the leading Ohio refineries is endeavoring to keep its eyes on every barrel of this kind of gasoline produced, and producers are continually being urged to sign long-term contracts for every gallon they can produce, the refinery to furnish the steel drums and the producer to consign it direct to the consumer in most cases. One producer in Oklahoma told the writer that an inquiry at two refineries, one in Kansas and one in Oklahoma, brought an offer of three cents a gallon, while one strong refinery did not care to entertain it at any price. Another producer claimed to be able to sell his entire output to a distributing agency at 10 cents a gallon. Another producer retails it to local automobile owners at 15 cents a gallon. A better, or at least a more regular market for the product has been established in the Eastern fields, where it is now practically all produced.

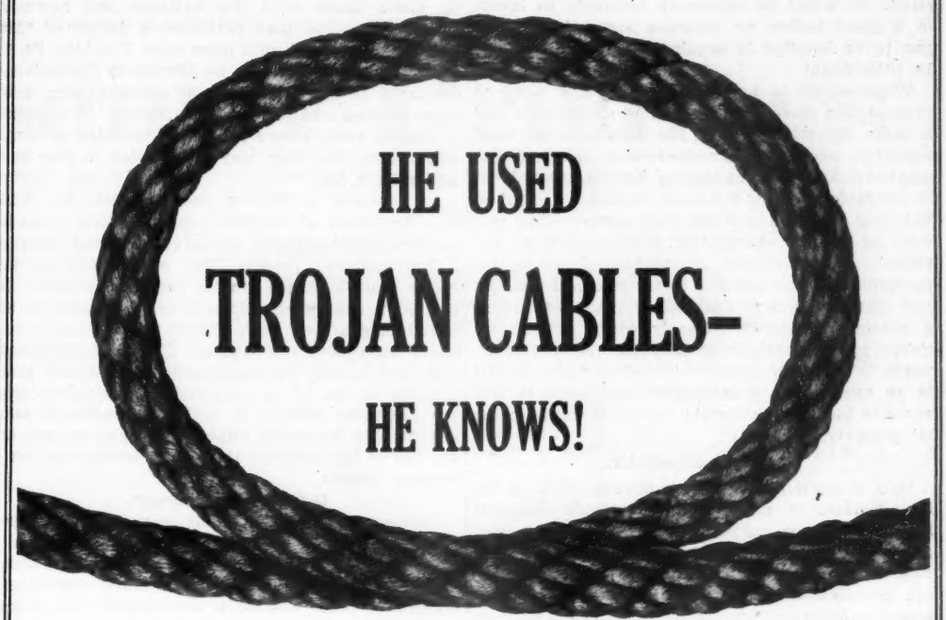
Eliminating Errors.

There are several methods of estimating the yield per cubic foot of gas by chemical analysis. The Bessemer people were the first to adopt this plan, which, boiled down, is to the operator: "We recommend two-stage process, high compression, 250 pounds; production, 3 gallons per 1,000." Or: "We recommend single stage process," etc. Samples arrive at the rate of 25 to 50 a day, in bottles, pipes, bicycle tubes and steel tanks.

The Blaisdell Machinery Company, of Bradford Pa., has its analyses made at the Pittsburg Testing Laboratory, the charge for which, it is understood, is $10.

A professor at Marietta, O., is engaged in the analysis work. A St. Louis ice machine company permits analyses to be made by its chemist, as the plant makes compressors that may be used in gasoline plants.

The Ingersoll-Rand Company, at St. Louis and Philadelphia, also makes tests and is an extensive manufacturer of compressors and engaged in installing complete plants for the extraction of gasoline.



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LARGEST SISAL ROPE MILL IN THE WORLD

D. W. Franchot & Company, who have the Bolivar liquified gas process, will make analyses as desired. It would be extremely foolhardy to invest in a plant before an accurate knowledge of the gas to be handled is acquired; of this there can be little doubt.

What seems to be the most pressing need at present is a more uniform system of analyses and a more perfect study of the gas and the most scientific method of manufacture to the end that maximum and uniform results may be secured. It is desirable to know the most economic method of handling the fluid and the best compounding process so that a satisfactory mixture will be obtained. There should be established places for operators to send samples to for standard analysis and where technical suggestions could be had at a reasonable charge. Nearly every district requires special methods of manufacture, and it appears to be easily possible to reduce these details to an exact science and make investment in this gasoline industry as certain as the operation of an oil property.

Field Characteristics.

Only a small percentage, it appears now, of the total volume of gas produced contains sufficient hydro-carbons of the paraffin group carried in suspension to warrant an attempt to liquify it. The best results, so far as examination determines, are obtained in the old fields where the oil is nearly exhausted. The extraction of gasoline from gas has already saved hundreds of wells from being pulled, notably in the Tidioute, Pa., district, and several old fields are being redrilled for the sole purpose of making gasoline. Along these lines there is undoubtedly extensive areas awaiting the new exploitation. In the Butler, McDonald and Sistersville fields suction pumps have been installed quite generally and there is a constant vacuum on the producing formations. This condition makes it advisable to use the less expensive single-stage compressor of about 80 to 100 pounds pressure, known as low-pressure gas. This style of plant costs from $1,000 to $2,500. Where the gas flows freely with its own pressure, two-storage compression is usually required, the first stage being about 50 pounds, stepped up to 200 and even 400 pounds, or, as at Bolivar, sometimes to 600 pounds, and the gas is known as high-pressure gas. The largest profits have been secured in vacuum-pumps territory where it is convenient to bring the gas to a common working center. The best results have been obtained from 10 to 20 small wells yielding a total volume of not to exceed 200,000 cubic feet.

Condensing Systems.

A number of condensing systems are in use, but the simplest one is a coil in a water tank, but water cold enough is rare, especially in hot weather. It is modified favorably by continuing the coil from the bottom of the tank out and back 40 feet and inside 4-inch casing. The expanded gases, which are frequently at freezing temperature, surround the inner pipe and act as a refrigerating agent. Ray B. Moore, of Bolivar, claims a secret process, but an operator of an investigating turn of mind thinks it consists of allowing sudden expansion into an iron vessel and then conducting the gases out and back 100 feet six times, the last two laps encased in the 4-inch casing, and applying the refrigeration mentioned. This is the D. W. Franchot & Company system and they have a plant in successful operation at Kiefer, in the Glenn Pool, Oklahoma, and are inviting any one to visit it and see the results. It is peculiarly desirable in Oklahoma, where the scarcity of water is noticeable, obtainable only at more trouble than is crude oil at times. John A. Bell, Jr., of Bartlesville, Okla., has a Bessemer plant in operation on a lease near Taneha, an extension of the Glenn pool. The quantity of gasoline produced by the Bolivar system varies with the temperature, illustrated in the case of one of the plants operated at Sistersville, W. Va., by Samuel Messer, which produces at the rate of 450 to 500 gallons in hot weather and 900 gallons in cold weather. To overcome this feature extensive tests are being made with expensive ammonia refrigerating ice machinery, with apparently very satisfactory results. A St. Louis house is in this business, and recently an Oil City, Pa., man perfected a device of this character, operated on a lease near Franklin, Pa.

This new industry may be likened to the activity displayed in air navigation, in points of age, new ideas evolved and the success attained. A number of mighty compressors are being installed to magnify results, but they may be dwarfed in size and power later on.

An operator at Kinzua, near Warren, Pa., and also the mayor of Bradford, claim a secret process for reducing the gravity of gas gasoline and making a homogeneous product that will evaporate no faster that the same gravity refinery product. It has been suggested that this process consists of introducing a steel tank loaded with 58-degree refinery naphtha in the system. The hot compressed gas, after leaving the compressor, is conducted first into the bottom of the tank and in passing through the 58-degree product is partially condensed and absorbs the low-grade naphtha, passing on out at the top of the inserted tank and through the condensing system.

Difficulty and Danger.

Compression gasoline seems to lack some of the fixity of the refinery product and is also difficult to retain as a liquid, but experience is suggesting many small economies. It is generally stored underground, from whence it is conveyed into steel drums of 50 or 55-gallon capacity. The evaporation gases engendered in loading are conducted back into the compressor and reliquified. A special drum is required with a perfectly-welded chime, for on a hot day the pressure, under agitation, will run up to 40 to 60 pounds. The most satisfactory way to handle the stuff, especially in hot weather, is to compound it with lower gravity gasoline at the plant. Even then, according to some experiences, if the compound is not stirred, the natural gasoline will rise to the top and disappear in a gas. For some reason its association with its refined relative is not so close as might be desired. And it can deport itself, when confined in a drum made of light material and disturbed, on a hot day in a scandalous manner, which has moved railroads and commissions to work on special rules to govern the shipment of natural gasoline. To be safe a 55-gallon drum should weigh not less than 95 to 100 pounds and cost not less than $5. Few makes of drums seem to have given satisfaction. A tank car loaded with natural gasoline and chased along a railroad on a hot day in the summer will lose one-third of its contents by evaporation.

There is always an element of danger where a product as inflammable as high-gravity gasoline is manufactured and handled, especially when high pressure is maintained by direct-driven compressors. The danger can be lessened by the use of belt-driven machinery, with the gas engine as far away as it is possible to place it. A number of explosions have already occurred in these gasoline plants and every possible precaution should be provided. If one of the things that can happen to machines running at high speed and under great pressure does happen the result is sure to be serious.

The Residue.

The value of the gas that remains after it has been relieved of the gasoline shrinks in proportion to the quantity removed, from 10 to 25 per cent certainly, some operators claiming 40 per cent loss in exceptional instances. The exhaust gas makes a brighter and cleaner light, if desired for illumination, and it is superior for gas engines, as the extraction of the gasoline removes all danger of carbonization, but in either event an additional quantity will be required to produce the efficiency, one authority claiming 5 per cent more. For heating purposes the depreciation is more noticeable, as the heat units are absorbed in the liquifying process. It is probably safe to say that of 1,000 cubic feet of natural gas turned into the compressor only about 750 feet will be found in the exhaust.

Transportation Difficulties.

It seems quite certain that the shipment of the high gravity product will not be permitted in the usual type of tank car commonly used for the shipment of gasoline. Any one who has watched the heavy discharge of gas from a car loaded with the light product will readily understand the cause of the enormous loss in the shipment of this product, from evaporation. This loss can no doubt be stopped, in case the product is shipped under pressure, but it is doubtful whether a railroad will care to accept a shipment of gasoline in a tank car carrying a heavy pressure. The results which would be sure to follow the smashing of a car of this product, in case of derailment or wreck, are something which any practical man would rather not contemplate. The great danger and difficulty incident to the manufacture, storage and transportation of extremely high gravity gasoline will, in the judgment of the man of experience, speedily place the manufacture and marketing of this special product in the control of those who are in possession of ample capital and who are acquainted with the peculiarities of gasoline of this type, and to such the business will appeal especially. The indications are that large plants capable of treating from one million to many million feet of gas per day will be located in areas that produce a gas of especial value for its contained products. The gas will be purchased by owners of such a plant on either a royalty basis or at so much per thousand cubic feet, or, perhaps, at a flat rate per well per year. Gathering lines will be laid to such properties as produce the richest gas. The operation of the plant will be placed in the management of experienced engineers who are familiar with the care of high grade machinery and equipment and who appreciate the danger and difficulty incident to the business, and to operators who can avail themselves of such a plant the results should be entirely satisfactory.

Oil or Gas Rights.

Gas, or air, blown through a tank of oil, fresh from the well, will absorb and entrain a certain quantity of these light products. The subject has many interesting possibilities. For those of an inquiring turn of mind it might be well to ponder over the rights, conferred in the ordinary oil and gas lease to the producer to save and utilize this casing-head gas. Does he have to pay the fixed sum specified in the gas clause? Or must he pay the specified royalty on the product manufactured and at the price the high grade product is sold? Is the product petroleum or is it condensed petroleum vapor or condensed natural gas? In case the oil operator has given the gas rights on the property to a gas company has the gas company the right to take the gas, as natural gas, when it can be shown that a most valuable part of the oil is also being taken? Can the oil operator properly demand of the gas company that it take only the natural gas—the methane, and deliver the liquid product to the owner of the oil rights? If the two interests are not harmonious there would seem to be a new field for the oil-lease lawyer, and it will open up a field for the expert, who will learnedly discuss CH_4, C_2H_6, C_4H_8, and impress upon the weary operator that there are other brands of symbols used in the game than the old-time "b. s." It is safe to say that the man who has watched a tank of this high-grade stuff suddenly take a notion to flow its entire contents a hundred feet high and float away as a highly explosive and inflammable vapor, evidently without any provocation other than a slight agitation (due to running a measuring stick into the tank), or who has seen a pet cock opened up from the receiving tank at the gasoline station, and the tiny stream of high grade impigne itself against a thermometer bulb and chase the mercury down in the bulb so far you would need a Dr. Cook imagination to tell how cold it really did indicate, or who had attempted to draw off a tomato-can full of the product to see how it looked, and found his fingers frozen where they touched the can.

As has been frequently said, the natural gasoline industry is in an experimental stage, and THE JOURNAL has been prompted to give publicity only to such observations as have the semblance

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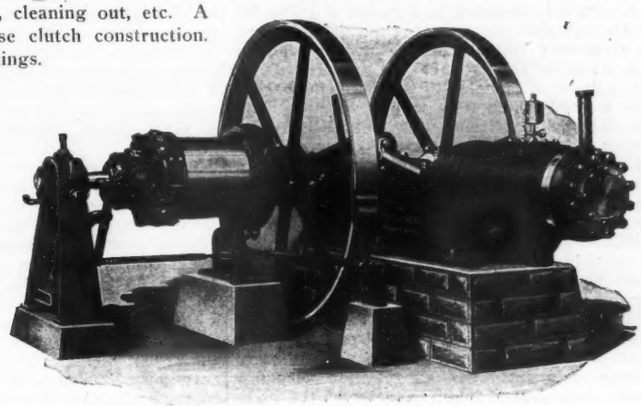

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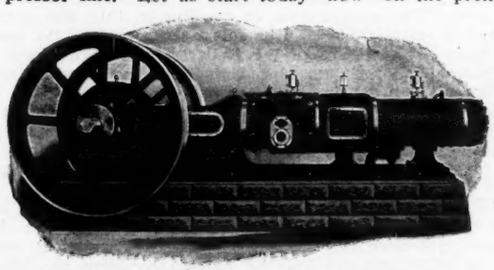

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of fact as much as an experimental and changing condition can be fixed until discredited. It is not desired to do this in a dogmatic or arbitrary manner, but to be conservatively helpful to those engaged or interested in the industry. Some of the statements here presented may be subjected to modification or discard by the experiments that are coming in increasing array and quickly from now on, as more people who must be showed get into the game, but they have come to us with fair credit and introduction, and the columns of THE JOURNAL are offered for reasonable suggestions. The contributed articles follow.

THE MANUFACTURE OF GASOLINE FROM NATURAL GAS.

By D. W. FRANCHOT, Tulsa, Okla.

Since the birth of the oil industry the problem of utilizing the waste products has been one of great importance to the thorough-going oil producer. It is a well-known fact that one of the great features of the Standard Oil Company's success has been the successful uses to which they have put every by-product contained in a barrel of crude oil. Today the oil producer goes out ahead and determines at a very considerable expense whether there is oil under the ground. He produces it and sells it, without a thought, to the purchasing company at a price which it is willing to give. Perhaps he may sell gas from a few wells which have gas under pressure to one of the gas companies in the field or to a pipe line pumping station, or perhaps the oil country town in his neighborhood; but up to today his casing-head gas, which arrives at the surface of the ground under practically no pressure and so heavily charged with gasoline that it has no value unless compressed, and then must be piped to market and for domestic purposes is undesirable owing to the soot it throws off, has been allowed to escape into the air. To utilize this waste product has been the aim of every good operator. Until now there has been no method of using this casing-head gas, except in a very few instances where some small quantity of the gasoline has been taken out, but only that portion which was eager to precipitate itself from the gas aided by crude means of compression and cooling. and the methods up to now that have been used would only take out a small proportion of the gasoline. and then only under most favorable atmospheric conditions.

It is the purpose of this article to set before the producers some of the essential features of a process which extracts virtually all of the gasoline from the gas and under all atmospheric conditions. or, in other words, summer and winter, all the year round, and without the use of a tremendous quantity of water and without the use of any ammonia plants or any other cooling agents, and to set forth the facts of how the gasoline, after it has been precipitated, can be poured into steel drums ready for shipping in all kinds of weather. To understand this subject thoroughly one must have the chemical essentials of the problem. We all know that a cubic foot of coarse sand does not contain as many particles as a cubic foot of very fine sand. We also know that every substance in the world is made up of particles in great or less number. Likewise gas is made up of particles known as hydro-carbon units. The chemical symbol of gas is "C2 H4." All gas contains varying numbers of hydro-carbon units, and the larger the number of hydro-carbon units the greater the per cent of gasoline it carries. Also, there are different kinds of hydro-carbon units, but in this problem we only recognize two: those that possess the faculty of attracting to themselves gasoline when they come in contact with petroleum and those that do not possess the faculty of attracting to themselves gasoline. Likewise these hydro-carbon units possess the faculty of attracting great or less quantities of gasoline, therefore carrying great or less quantities of gasoline. These facts can be approxfmately determined by a chemical analysis, but what per cent of gasoline per thousand feet can not be exactly determined. only approximated, and no conservative concern has yet dared to sell a system with a guarantee that so many gallons per day will result.

Just here the question that presents itself is: How can we take gasoline from gas. since a gallon of gasoline weighs approximately five pounds and from three to four gallons of gasoline is extracted from 1,000 feet of gas, when gas apparently weighs nothing? This question can be answered by the following figures: 1,000 cubic feet of average Pennsylvania and West Virginia gas weighs 47.5 pounds. The average Ohio and Indiana gas weighs 48.5 pounds and the average Kansas and Oklahoma gas weighs 43 pounds, while the gas of California, although we have no authoritative figures, weighs considerably more than any of the above mentioned gases.

Gas that will make gasoline in paying quantities must have come in contact with petroleum, because dry gas does not carry a large enough per cent of gasoline to be utilized for this purpose. It can literally be said that gas is a thief, and when it comes in contact with oil it robs the oil of some of the higher distillates. The degree of Beaume gravity, therefore, depends upon the Beaume gravity of the oil from which it has robbed its distillate. There are places in Pennsylvania and New York where the gasoline is of 110 degrees Beaume. In Oklahoma 86 degrees is about the maximum. Naturally, at this time, the producer wants to know how high this distillate can be used commercially. All gasoline is handled by weight. Therefore, 50 pounds of 86 gravity mixed with 50 pounds of 56 gravity will give 100 pounds of 71 gravity; or if 69 gravity is desired, add to 50 pounds of 86 gravity 50 pounds of 52 gravity; or, increase the amount of low distillate and decrease the amount of high distillate. This is merely a mathematical problem.

The machinery necessary for making gasoline is a two-stage compressor cast in a single unit, belt driven. The two-stage compressor cast in one unit is quite necessary in order to maintain a perfect equilibrium of compression, and compression means heat between the first compression and the second compression, and it needs a type of compressor with an inclosed inter-cooler so that the temperatures under varying atmospheric conditions can be controlled. Just here it may be relevant to give a few figures: Where gas is compressed in a single cylinder to a gauge pressure of 350 pounds the final temperature, with perfect intercooling shows 867 degrees Fahrenheit. At 90 pounds pressure gauge it shows 459 degrees. In the two-stage compressors the final temperature, with perfect intercooling. shows at 90 pounds 234 degrees and at 350 pounds 370 degrees. These figures are in air compression and are theoretical, because there is no such thing as "perfect intercooling," and a mathematical progression takes place which shows the temperatures to be greatly in excess of these given. It is a chemical fact that gas, when subjected to compression, creates greater heat than air, so that in a perfect process it is conservatively estimated that gas compressed by a two-stage compressor at 350 pounds gauge pressure will be very close to 600 degrees Fahrenheit.

The reason that a belt-driven compressor is essential is to separate the gas engine from the compressor, because when this gas is compressed to an extremely high pressure it is as dangerous as the highest known explosive. Also, the compressor should be equipped with a double stuffing-box connected to a vent through the roof so that in the event the packing in the gland becomes defective the gas fumes can be carried off into the air. It is extremely essential to have the inter-cooler of such a nature that the temperature can be controlled, as is above mentioned, between the two compression stages. The ideal motive power is two gas engines connected to a counter-shaft so they can be run slowly at about 150 revolutions per minute, and the speed, which is essential to develop the required efficiency at the compressor, can be multiplied by a larger pulley on the counter-shaft; also the counter-shaft gives a greater elasticity between the compressor and the gas engine and incidentally gives an opportunity to attach either a small lathe, drill press, ball and seat grinder, grindstone. etc., which are used by oil producers everywhere. Furthermore, if one gas engine gets out of order it is only necessary to reduce the volume one-half at the intake valve of the compressor and the plant can be run at half capacity. From an economic standpoint two units in a gas engine can be purchased cheaper than the same number of horse-power in one unit. The plant must be equipped with electric lights and it is desirable, though not necessary, to use an electric ignition system on the gas engines. After the gas has been compressed it is delivered to coils which are either submerged in a bath of water or to some ammonia process. but the ideal system is that patented by the Liquified Gas Company of Bolivar, New York, in which no cooling agent is used other than the expansion of the gas. Water, of course, has to be used to keep the gas engines cool and to cool the compression cylinders of the compressor, but only a very small quantity is necessary for this purpose and it can be circulated indefinitely.

After the gasoline has arrived at the separating tank, or making tank, or drips, it is under the same pressure, approximately, as when it left the compressor. The problem now is to reduce that pressure so the shipping drums may be filled without the loss of any of the manufactured product. This feature has been worked out by only one gasoline company, but it is not of a nature that it can be protected by patents, and any one who investigates the problem will readily see how it can be done. It is necessary, for the successful operation of a plant, that the stock houses and making houses be built of cement in order to exclude, during the hot season, all heat, because gasoline is so volatile that heat affects it.

Again a few figures may be of interest. A drum, such as is used for shipping gasoline and high distillates, filled with 64-degree (Beaume) gasoline, allowed to stand in the sun when the thermometer registers 95 degrees, with a pressure gauge attached shows that the heat has caused a gas pressure of 29½ pounds. For the purpose of transporting gasoline special drums have been designed to withstand over 80 pounds pressure, and during a period of over three years no accidents have occurred where the special drums have been used.

The impression is prevalent that it is only necessary to heat gas and then cool it. This, in a way, is true, but the real problem is to extract all of the gasoline from the gas. In order to do this the gas must be treated repeatedly; in the Liquified Gas Company's process the gas is treated seven times and a chemical analysis shows that practically no gasoline is contained in the gas after it has been treated. To be sure, slight traces can be detected. This point is nicely illustrated by the fact that lease lines carrying gas, on cold days, have to be drained frequently.

The impression is also prevalent that any kind of machinery and equipment will make gasoline; true, in a measure, because any system and any kind of equipment will produce some gasoline. The impression prevails that any lease man or pumper can successfully make gasoline; this is error, because a very high type of man is required to run a plant, for every second of the day his mind and eyes must be working, studying temperatures and watching gauges.

A conservative estimate is that only one property in ten possesses the required conditions to install a profitable plant. And there is only one system for making gasoline that can handle gas in any quantities, no matter how great.

The next thing that comes into a producer's mind is: "What will I do with my product?" We all know that refineries have left on their hands quantities of naphtha and low grade distillates. They desire the high distillates for mixing with the low grades so they can make gasoline for the automobile and internal combustion engine trade. In 1910, 38,000 more internal combustion engines using gasoline were sold west of the Mississippi river than during 1909; during the year ending January, 1911, 658,000 more barrels of gasoline were sold than during the same period in 1909. The consumption of gasoline in 1910 was approximately 9,600,000 barrels, as reported by the bureau of statistics of the Department of Commerce and Labor. This represents only the gasoline manufactured in America and does not include that which was imported. From these figures and the knowledge that companies for the manufacture of internal combustion engines are organizing and put in operation every day, it does not look as if there would be any scarcity of a market.

The great navies of the world are installing gasoline engines in their warships and it has been proven, beyond question, that a sufficient supply of gasoline can be carried to drive the biggest battleship twice around the world.

The cost of operating a plant should not exceed, including everything, $15 a day, and a plant capable of making 700 gallons of gasoline per day can be installed for $10,000, complete. Since there is a ready market for gasoline at 10 cents a gallon it is easy to see there is a tremendous profit in sight.

Another thing that presents itself most forcibly is, after one has mastered the problem of making gasoline, the possibility of installing small re-

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See Article, This Issue

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fineries or skimming plants on leases, the same as power plants are installed throughout the oil country, to obtain the low as well as the high distillates and make a barrel of oil worth several times its present value.

To summarize, a producer must ask:

1. Is the gas of the right quality?

This question can be answered by a chemical analysis and the knowledge of whether the gas has ever come in contact with oil.

2. How much gas have I?

As the minimum desirable plant is 230,000 cubic feet a day, this question could be answered by gauging his wells. But the following figures must be borne in mind and accurate deductions made: If, for instance, the total of all gas produced by a series of wells on a property, measured at the casing-head after having been allowed to flow open several hours, shows 1,000,000 feet, only about 30 per cent will find its way to the intake valve of a compressor. The per cent of loss is due, to use a technical expression, to "gas slippage." Therefore, if a property gauges, by the accepted measurement, the Pitot tube measure, at the casing-head, full allowance must be made for the output of the plant, which is dependent upon the number of cubic feet compressed and the gallons per thousand feet the gas contains.

3. What can I do with my product?

This must be answered by finding some one to buy the product, dependent, of course, upon business energy.

4. Do I want to install a system that will run day and night, year in and year out?

This question can only be answered by inspecting the various processes and learning the grade, sizes and weight of material used.

5. Do I want a process that will make gasoline in summer as well as in winter?

He must ask himself if he is willing to invest money in such machinery and equipment as can be used indefinitely, or does he prefer to economize at this point and put in an inferior equipment which would always be giving trouble?

Having determined these questions to his satisfaction he is ready to take up the serious problem of entering into a contract with one of the different companies handling gasoline plants.

The question of buying gas may appropriately be taken up. It is the opinion of the best lawyers and hard-headed business men that the royalty interest is entitled to a revenue, and it is generally accepted that the same royalty applies to the gas as to the oil. For instance, if your lease calls for one-eighth of the oil produced the royalty interest can be paid at one-eighth of the price agreed upon per thousand feet. And just here it may be relevant to say that 1,000 feet of gas entering into the average process comes out at the other side reduced to about 750 cubic feet, but neither the heat nor light units are destroyed under a pressure proportional to the original compression.

In conclusion, the question may present itself: "What is the effect on the oil well?" A successful process takes its gas into the compressor at atmosphere. Since a gauge will show zero at the compressor there can not be any back pressure or vacuum created at the well, therefore a legitimate gasoline plant is not a gas pump in the guise of a gasoline plant and the wells and casing will not be injured in any way. However, it is the opinion of those who have gone into the subject thoroughly, that wells respond, in a degree, to the aid given them by taking off any pressure caused by atmospheric conditions or by the weight of a column of gas, because it goes without saying, since gasoline is taken from gas, that a column of gas must have considerable weight. One thousand cubic feet of air at an atmospheric pressure of 14.7 pounds, which is the atmospheric pressure common to most areas and is the accepted base, at a temperature of 62 degrees, Fahrenheit, weighs 76.1 pounds; and since 1,000 cubic feet of gas weighs on an average throughout all oil-producing countries about 46 pounds, the pressure on the sand is very considerable. When one considers that a column of gas 6⅝ inches in diameter and 1,000 feet in length weighs a fraction over 11 pounds and is augmented by the atmospheric pressure, which is 14.7 at sea level and at 1,000 feet elevation 14.17 pounds, it is readily seen that the gas and atmospheric condition create a pressure on the sand of approximately 25 pounds. At least the atmospheric pressure is kept out by means of gathering lines and the suction necessary to draw the gas into the compression cylinders absorbs a certain per cent of the downward pressure of the column of gas.

Nothing has stirred the producers throughout the oil country as has the possibility of making something valuable from a heretofore waste product, for the earning capacity of a property is increased many times when a gasoline plant is in operation.

Another far-reaching effect of this discovery and utilization of a waste product is that it creates a market, that can not be at this time estimated, for lubricating oils, because, since the supply of gasoline is more assured and increased, a corresponding number of internal combustion engine manufacturing concerns are being organized and a proportionately greater number of people who were not sure of their supply of fuel are now prepared to install internal combustion motive power. Since the fact has been determined beyond peradventure that gasoline can be made from gas the new supply will have the effect of keeping at about its present value a gallon of gasoline.

THE RECOVERY OF CONDENSIBLE HEAVY HYDRO-CARBONS FROM NATURAL GAS —NATURAL GAS GASOLINE.

By FRANK P. PETERSON.

With reference to the historical phase of the development which this comparatively new industry is undergoing, the writer is not prepared to present what he considers would be full and sufficient data to do justice to those pioneers who contributed to the industry its initial step.

Beginning possibly with Richards of Mayburg, Pa.; Hollingshead at Bradford; McCarty and his associates at Bolivar, N. Y.; the South Penn Oil Company at Evans City, in Butler County, Pa.; J. P. Flynn for the Reno Oil Company, and Kerr and the Robinson Brothers for the Riverside Oil Company, Sistersville, W. Va., we may safely say that these individuals are due to receive the major portion of the credit which is due for the early developments which have led to undertakings that have unquestionably reached a commercial status, commanding the attention and the universal interest of oil and gas producers.

It is of particular interest to note that these pioneers were working along lines identical in character, though differing slightly in means of application, but involving the same physical laws, and obtaining results consistently parallel, excepting in each case the conditions which were peculiar to each locality and the materials upon which each individual had to work. It cannot be said in connection with this matter that it has a parallel to some important inventions which mark vast steps in the progress of the industries which they vitally affected.

In the case of the development of a process for cheapening the manufacture of aluminum, for instance, Charles M. Hall, an American student, and Dr. Paul Héroult, a French scientist, developed simultaneously the step which effected the long sought results by an electro-chemical application, which solved to the present state of perfection the whole matter and gave to the industrial world the metal at a price and in quantities which make it one of our most important structural materials.

In the launching of the airship, the Wrights in America, Bleriot, Farman and Dumont in France, to say nothing of the various minor claimants to honors, German and English inventors, gave to the world simultaneously, it may be decided, the means of flight.

Instance after instance of inventive development of this character could be cited. It is rather to be concluded that the development of the condensation of gasoline from natural gas came as a natural sequence to evidences so plain and unmistakable to those who were first in application of the means which should consistently have been employed years ago, as the common sense application of one of the best known of physical laws which supplied the missing link in the realization of gasoline production in commercially paying quantities. One of these early workers has often stated to the writer that he had suspected so strongly the possibilities that were to be realized that he had anticipated the results he now obtains years before the opportunity was presented for him to apply a test and satisfy his reasoning to that end.

It is rather surprising to the student of physics that this very simple matter of condensing into liquid the heavy hydro-carbons from a gas in which they are present has lain dormant and unattended to for so long a period of time. Perhaps the only consistent accounting for the fact is that to within a very few years past the quantities of gas which would have yielded such condensates were looked upon as insignificant. Indeed, it may be said that the world outside of oil production does not at this moment consider with sufficient seriousness the extent to which this industry yielding gasoline from natural gases may reach.

It is only recently that such centers as New Orleans, Birmingham, St. Louis, Cincinnati, Columbus, and even Baltimore, New York and Philadelphia, have looked with some degree of justification to the possibility of obtaining natural gas for their lighting and domestic fuel supply. To what degree this expectation may be justified is now evidenced in the fact that a few of those centers mentioned, to say nothing of many others unmentioned, almost as important, have realized and are enjoying the benefits of this great natural gift. The continual opening of new natural gas deposits, yielding enormous volumes, makes it not unreasonable to conclude that a major number of our cities may hope eventually to share in this distribution of natural gas. The production of gasoline, however, as a by-product of the gas industry, is not to be considered the important source from which our natural gas gasoline is to come. A few rich deposits, exceptional in character, such as have been tapped in West Virginia, of enormous natural gas production, are destined to yield very noticeable percentages of liquid condensate to be recovered. As to the future deposits that are to be explored and developed in the regions which now give promise for natural gas and oil but little can be said. These stores are so deftly hidden in Nature's magazines that only time and perseverance can develop the enormous extent to which they may be drawn upon.

The North Dakota and Wyoming fields, which have been prospected only sufficiently to develop the fact that much is to be expected, as well as the Mississippi and Alabama deposits offer in misty surmise a promise of sufficient quantities to complete the circle and eventually supply the whole community for at least a short period of consumption. At any rate, it is safe at this moment to state that were all the sources of waste in the production of oil and gas brought to useful service there would be enough and to spare of natural gas fuel to supply all those centers which could support the construction of pipe systems through which it could be delivered, and this statement can readily except all that might be recovered in the way of liquid condensates and delivered to the consumers, who might use it for whatever purpose it is adapted.

It is the purpose of this discussion, however, to enter rather more definitely upon the methods for the recovery of liquid condensate from heavy gases, its present extent and commercial importance as related primarily to the producer and secondarily to the consumer. Along with the credit which belongs to the pioneers in suggesting the development which has followed, some must be conceded to the pioneer firm of manufacturers who saw in the idea an industry which could be presented with profit and a realization of no small saving to the producer and the consumer of petroleum products.

The Bessemer Gas Engine Company, against the doubts and discouragement of many who were disposed to consider it as an insignificant phase of petroleum production, had watched from the beginning these initial movements and at the time which seemed proper they undertook the launching of the industry in a practical way and on a commercial basis. After a careful study of what they were reasonably sure could be drawn upon as a source of material which would offer more than a momentary usage, after a more or less indefinite estimation of the extent of heavy gases which could be expected to yield results, they decided that the matter was a presentable one on a truly commercial scale.

About 10,000 appeals reaching the nerve centers of the oil and gas producing interests throughout the United States, once every thirty days, took the liberty of presenting the matter in terms which held forth nothing but the reasonable conclusions which they had reached. They were unable to say to the oil industry in general that any one set of fixed conditions might exist. They were unable to present a statement that all gases were to yield gasoline in any fixed ratio. On the contrary, by quiet investigation, they had determined that the development of the matter as an industry involved the most trying and unexpected reverses if handled in any but the most careful and painstaking manner. They set to work as pioneers in their own

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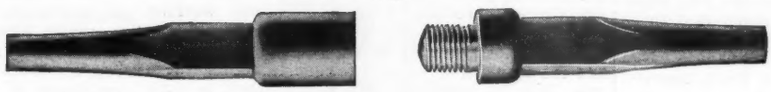

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division of the development to establish means by which the interests of the entire industry might be safeguarded. Of course, their primary interest was the opening of a new source into which their line of machinery could be delivered with success and profit to themselves and the purchasers. As pioneers in the development of a line of straight-line, direct-driven gas and air compressors, they had reason to look forward to a vast distribution of this particular line for the purpose and the need which the natural gas gasoline industry possessed the key to open.

There hung an obstacle in the way to this realization in the hazard and the uncertainty with which the practical application of the scheme might be safely approached. It developed upon the writer to undertake whatever means might appear to be most practical for a simple method which could be most economically worked out in the interest of the purchaser and the manufacturer of equipment to safeguard both against disaster in the investment necessary to sustain and carry forward the development which appeared possible.

In the outset the chemical laboratory was looked to in a sense of longing and doubt. None more fully than the gas chemist has a right to realize the difficulty which such a plan seemed at first to present. In all that has been done in the technical examination of gases, for any purpose whatever, it may be said that comparative results are all that the average mortal has been able to obtain.

Orsat and Winckler, to whom we look with no small degree of reverence, may have been able, as they claim, to conduct what is termed exact gas analyses. We who have tried in their footsteps know only too well what it means, and it is safe to say that neither of these scientists spent a very considerable portion of their effort on the treatment of natural gases of the complexity that those which yield gasoline in paying quantity enjoy. This does not embrace the parallel fact that these gases enjoy the distinction of presenting every conceivable degree of variety in structure.

It may be suspected that, once conceiving the idea that a scheme of analysis could be made feasible, the writer entered upon it with fear and trembling. Nor was he alone. Hundreds of analyses were run purely for comparison before it was even hoped that they might be safely and incontrovertibly applied in the sense they were trusted to serve.

It is sufficient to say, in conclusion of this reference to the matter of analyses, that the results in practice are consistent with those to be predicted in the laboratory, and that the minimum of time and expense on the part of all parties concerned, with what may amount in the end to millions of dollars saving in the investigation necessary to predict the value of the holdings and the justification of investment to recover the gasoline which may or may not be present.

The justification and the necessity for a scheme of analysis or definite preliminary investigation lies in the following facts, which have been demonstrated to be true: The truth of the demonstration first appeared in efforts for the preliminary application of the scheme without some means for preliminary safeguarding of the movement to install machinery for the purpose of obtaining condensate from gases which do not produce. For instance, one property producing gas of apparently the same character as that produced by an adjoining property did not produce gasoline in paying quantity, whereas the adjoining property did. This was determined in a number of cases by the application of parallel means to both cases. It became evident then that one gas, though appearing similar and producing from similar strata, apparently, would be productive while the other would be nonproductive. We will leave the accounting for this discrepancy for further reference, and revert to the fact that as soon as our analysis scheme became effective we were able to determine that these differences certainly did exist, by the mere cost of obtaining a sample and examining the same with a few hours loss of time for an individual in the field and in the laboratory. It has been demonstrated in the case of a single lease, for instance, that one end of a string of wells covering a mile or so in line of drilling will produce gasoline in very paying quantities while the other end will, though producing oil and gas in practically the same ratio, produce no gasoline that would be worth while attempting to recover. The justification, then, in a scheme of analysis or some definite method of determining the value of the different adjoining properties, or even different portions of the same property, is fully established.

Once the extent of the above condition was suspected, the writer became convinced of the almost imperative demand for a less expensive method of investigation than field tests by means of miniature plant equipment involved. There is no doubt that such a scheme of physical examinations would be very satisfactory and entirely dependable in the hands of an expert manipulator and engineer who could be depended upon to exercise careful judgment and submit reports that would be correct to within a narrow margin of error, but it is quite apparent that this method would require the time and best effort of an individual especially trained for the application of gas engineering principles. Such men are difficult to obtain and are expensive to maintain when available. Not only is this true, but the loss of time necessary to the conducting of such experiments as would be as satisfactory and comprehensive as chemical analysis can be made is a serious factor in prolonging the investigation desired and the loss of valuable time in the development oftentimes of what becomes most desirable investments.

That the Bessemer Gas Engine Company was a pioneer by dint of determination and the expenditure of large sums of money and a patience commanding much respect in the working out and establishing of a method of chemical analysis will have to be fully admitted, and for the writer's part in the same he is indebted to Dr. O. J. Sieplein, holding the chair of chemistry in the Grove City college, and also to Mr. Byron B. Stroud, for valuable assistance in the application of the practical methods to obtain the desired results. Also the means which could be employed in the hands of the general public for the obtaining of samples of gas for examination demanded careful working out in order that it might be made practical and dependable. The satisfactory sampling of gases and the transportation of the same to points where they may be examined has always been a work requiring care and precision even on the part of scientists whose training prepared them for such work.

The primary idea was in some sense to try to follow the methods that such men have used, consequently special glass tubes were made up and distributed for the purpose. It did not require long to demonstrate that this method would suffer seriously from breakage loss and improper handling of the fragile glass vessels. The next step employed a more substantial vessel made up of iron in a similar manner to the glass one which had proven unsatisfactory. Not only were these iron sampling receptacles heavy and expensive to handle, but they were more than frequently improperly filled and frequently serious leakage losses occurred involving inaccuracy and unsatisfactory results in the end, and the final method resorted to was the use of ordinary bottles with corks and paraffin sealing. The results have been so satisfactory in the use of this method that the writer feels confident of its having become the standard method which may be employed with the greatest degree of general satisfaction to all concerned.

Now, in reference to the variations which appear in the characteristics and subsequent yield of the condensate to be expected from different gases, even in similar localities and adjoining properties, it is necessary to use a little reasoning based upon the probable physical structure of the strata in which the deposits of oil and gas are found. For instance, after the discrepancies have appeared it is possible in a great many instances, if the driller of the well can be found, to ascertain that, in the case of a well showing unexpectedly nonproductive gases, the gas will have been found to come from a level materially above or below the actual pay streak in which the oil is found. Oftentimes a difference of 10 or 12 feet in thickness of sand between the oil pay and the gas production will show a striking indication toward no production, so far as condensible matter is concerned. It is not to be supposed, because of such a physical structure and the apparent nonproductiveness of the gas which does not flow directly with the oil production, that such gas as does flow directly with the production would not yield a condensate in favorable quantity, but it can be readily supposed that if the gas production from the non-oil-producing stratum predominates heavily over the production from the oil-producing stratum, this gas flowing from the oil stratum will be so diluted with the gas having practically no gasoline value as to make the total production undesirable for operation, and there is every degree of variance from the condition which would make it entirely unsuitable and undesirable to operate to that condition which makes it most productive and most desirable for the purpose.

All these foregoing conclusions arise in conjunction with the fact that from the unlimited variety of the gases which are to be found there is also an unlimited variance in the productiveness which may be realized throughout the vast range of the differently constructed gases.

To this date, so far as the writer is informed, an actual maximum production realized in plant operation has reached somewhat in excess of 10 gallons per 1,000 cubic feet of gas delivered to the condensing equipment. Such a gas will have a weight, of course, somewhat in excess of that of the atmosphere, and of such gases a considerable portion are so heavy as to be visible, and it goes without saying very dangerous in all phases of their handling, since they are quite similar to the vapors which rise from the surface of the gasoline when it is permitted to evaporate.

The general features of the industry are now so sufficiently well understood that it is hardly necessary to say that those gases which are most productive of gasoline are those which flow from oil-producing wells with the ratio of gas production relatively small as compared to the oil production, and with the gas production flowing from the same stratum and at the same level as the oil produced. It is also the fact that the lighter and more volatile the character of the oil produced the greater the relative proportion of condensible hydro-carbons present in the gases. This is all demonstrated plainly in the phenomenal returns in gasoline which are being obtained in the Ohio valley deposits of oil and what is commonly termed casing-head gas.

It is reasonable to expect at this time, with present knowledge of petroleum production throughout the world, that the Ohio valley, Berea and kindred deposits will furnish the maximum of easily recovered condensates from natural gas. The present production of what we term natural gas gasoline from the Ohio valley deposits, between Marietta and Steubenville, will reach a probable total of 17,000 gallons daily.

One other phase of the subject, based upon theory wholly, is that age of the producing territory contributes materially to its value for condensate to be obtained. It may, then, be reasoned, with reference to this phase of theory, that the most important deposits to be drawn upon for production will be those of the old Pennsylvania development. Present developments in operation for gasoline are of such extent that, while divided into somewhat lesser units operating in several regions in Pennsylvania, they are liable to approach in importance those centers which have developed the greatest production in the Ohio valley. Inland regions in West Virginia also promise large returns at no distant date, as do those of Oklahoma and the outlying sections of the Kansas and Louisiana fields, as well as those of California, which promise extensive development.

Present extent of development, as far as evidences of preliminary investigation go, is difficult to estimate, though it is reasonably certain that it is not relatively great. With the beginning of the present year there has been an increased activity looking toward development and installation of plants which indicate that last year saw only the beginning of the industry. To date the activity looking toward production of the condensate has been confined mainly to active and new petroleum operations and to the examination of some small percentage of fuel gases which show evidences of sufficient condensible matter to be worth looking into.

A few abandoned operations in the older fields are to be reopened—all, in fact, that are productive of gas in any appreciable quantity and which have been protected from water flooding—if not immediately, at no far distant day, for the returns they will yield in the production of gasoline added to the small yield of oil, which was not sufficient to sustain them in operation.

One very interesting phase of this new development is an assurance that the longevity of a profitable yield in gasoline will be greater than ever the petroleum alone could promise or sustain.

The application of gas pumps wherever the oil production itself may not be injured can only tend to enhance the gasoline value of the gas being treated. When we reason also that the production of gas must be materially increased, it is consistent to expect that the use of gas pumps will become more generally and extensively employed. Looking

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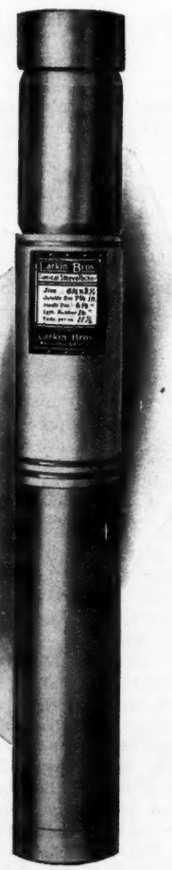

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to the older gas-pumped territories in the Pennsylvania field and assuming that in many localities a parallel condition will develop, we may look forward to 50 years of gasoline yield.

The present observed developments hold forth some promise that while under gas-pumped treatment the gas volume cannot possibly hold up constant, the gasoline value will increase in inverse ratio to the decreased volume of gas to an extent which will maintain gasoline production practically constant for a long while to come. It is well to state in this connection that gas pumps are not necessary or essential to the production of gasoline in very paying quantities wherever the same is present, and that the application of gas pumps is not essential except as a means of hurrying the final exhaustion of the total resources of the strata in oil, gas and the condensates obtainable from the gas. The justification for the gas pump will lie finally in the reasonable supposition that vacuum applied to the strata will reach into the inaccessible nooks and corners from which there would never be a natural flow release of either the oil or vapors held there.

The further and the more urgent justification for the gas pump will come with the ever increasing demand in consumption of the motor fuel which will make it necessary that every measure of economy and efficiency of production be employed in order that the sands may be stripped eventually of every vestige of available fuel that they contain. Come what may, we have to look forward, within a mighty few generations, to the bare and undesirable realization that our petroleum fuel supply must be exhausted. However, the writer has found that the average oil producer will not permit himself to think seriously of this phase of the subject; therefore he will not persist in presenting the thought too insistently.

At present we find consumers of motor fuel critical and discriminating in their selection of what they will use and refiners and dealers are able in some measure, though they are showing evidences of weakness, to humor the consumer's whim. The day is coming only too rapidly when his whim will change to an insistent desire which will accept practically anything that will make a smoke and keep his motor turning. For, while the production of natural gas condensate will reach no small magnitude, from the average individual's viewpoint it can add but little to the vast total of the market gasoline as at present consumed.

Using the language of a representative of one of the largest refineries in the country, after a possible estimate of the year's production to be realized in 1911, it was dubbed a "drop in the bucket" when compared to the enormous volume, mounting to round millions of gallons for the total consumption. It cannot, then, be expected that the total production of the natural gas product, when it can be realized, will make the slightest impression in market values for gasoline as it is offered to the consumers.

A brief description of the means employed to the end that the precipitation of the condensible portion of the gas may be realized will be of interest to many who have not given the subject the practical investigation that it deserves. It is entirely out of the way to suppose that there is anything obscure or mysterious in the process of condensation. It is one of the simplest known to physics, of the applying of pressure and reducing of temperatures to induce the precipitation of moisture present in any gas, and the means to be employed are whatever may be available in the way of compressors and the reduction of temperatures to the necessary point which will induce a satisfactory precipitation of the condensible portion of the gas. How far this precipitation may go will depend not only upon the extent of compression and reduction of temperature, but also upon consistent and very necessary special arrangement of the condensing system that may be employed. This latter very important feature is one which demands the closest attention and experience born of actual practice rather than of any theory that could be presented.

The physical laws which are involved in this comparatively simple process would assure us that the higher we carry the condensing pressure and the lower the corresponding temperature, the more complete will be the reduction to the liquid state of the gas treated. It is undoubtedly true that theory and practice go hand in hand, provided practice permits theory a small part of the time to get in her work. Therefore, it may be readily concluded that various degrees of precipitation can be realized in the application of more or less imperfect means and methods of operation, and it goes without saying that the more extended the experience the better able the experimenter will be to accomplish superior results.

It has also developed in the observation of the company which the writer represents that gases from different localities are so seemingly different in structure and characteristics, with reference to the condensible matter carried by them, that apparently very efficient results may be had from certain gases with very lenient treatment and very ordinary standard pipe condensing equipment. Other gases will demand the most rigorous treatment to equal those which yield a higher return in condensible under the more lenient treatment.

However, the writer is ready to conclude that the residue gases from some of these less rigorous applications are sufficient to warrant the statement, when the day of scarcity arrives, that they deserved more critical consideration.

In the outset the writer felt it necessary to admit that the Bessemer people had watched this development with a view to introducing it commercially as soon as appearances should justify a conclusion that it would bear such presentation. It is only fair, in connection with this admission, to state also that they were watching just as closely the means which had been employed on the practical side of the development as it progressed. Realizing that the most desirable results might be obtained in the selection of the best practice which at that time prevailed, they have embodied in the condensing equipment they now offer, in connection with their compressor machinery, those combined features which had been determined by trial to be the most useful and efficient in accomplishing the end desired. And in the equipment which they have to offer there is combined all that is simple and effective and within the grasp of the average field operator. The compressor equipment which they were prepared to offer at the outset combined the novel feature of gas engine and compressor in one piece. Fortunately these compressors had gone into the most exacting service for some years prior to the step which brought forward the gasoline from natural gas industry. So thoroughly had they been tried and proven equal to the most severe gas compressing service that there was not the slightest hesitancy in presenting them for the severe conditions of service which the production of gasoline undoubtedly imposes. The addition to this compressor feature of those combined features above mentioned which had been selected from a close investigation of what had been accomplished by the pioneer experimenters and operators of already successful plants accounts for the phenomenal sale and placing of equipment which has resulted from the effective campaign of publicity they have undertaken to support.

A reference only to some of the returns which have been realized from the installation and operation of plants is necessary to explain the excitement which arose as soon as publicity was given to the facts. In June of last year one of the Ohio valley installations was undertaken. When the plant was placed in operation the yield was seen to be 1,800 gallons of very high grade gasoline for each 24 hours of operation. Some 200,000 cubic feet of gas was being passed into the condensing plant, resulting therefore in a production of 9 gallons per 1,000 cubic feet. The market realization for this product was 11 cents per gallon at the plant. The total cost of installation of the entire operation could not have exceeded $5,000. Assuming a depreciation of 25 per cent yearly for the plant, fire risks and all liabilities, 6 per cent interest on the investment, $10 a day for labor and incidentals to operation, and 2 per cent of the total time out of service for repairs, this makes a 1,600 per cent investment. Had the yield from this installation been one gallon per 1,000 cubic feet instead of 9, the return on the investment would have been in the neighborhood of 7 per cent.

The physical appearance of the product varies somewhat in different localities and under different treatment. As above stated, the intensity of the temperature and pressure treatment applied will affect the total yield of product proportionally as the intensity of the treatment is increased. Along with this fact arises the parallel raising of the Beaume gravity or decreasing of unit volume weight of product. As the Beaume gravity is increased and the weight per unit decreased the volatility of the liquid increases. From those plants which yield the maximum production are usually realized the highest grades of product. As a rule, the condensate is absolutely water white and of the purest and most desirable character. Wherever the production can be carried on to an extent justifying local treatment of the natural gas product, it is well to apply the extremes of pressure and temperature and obtain the maximum of production, and when this is accomplished to bring in the lower grade distillery products with which the gas condensate may be tied down and the loss from evaporation reduced to a minimum.

The excellent character of the natural gas product is beginning to be understood by the consumers of motor fuel. While it is reasonable to expect that the untempered, very volatile product would be too flashy and gassify too readily to meet the adaptation of the modern carburetter, the purity and desirability otherwise of the product, when mixed with heavier grades of gasoline, is readily recognizable. Consequently the demand for the high grade natural gas product is in a healthy embryo stage at this writing. The one unpleasant feature of the process is the danger which attends the operation of the plants. It must be emphasized here and at all times, that no precaution which can be taken is unnecessary or unjustifiable to avoid the occurrence of fire and ignition of the vapors which are liable to accumulate about plant premises. Leakage and waste from the condensing systems is liable to occur at times in spite of the best management and operative endeavor. As above stated, the vapors which escape are so heavy they remain near the earth, and unless the breezes may be counted upon with certainty to remove them it would be utter folly to permit open fires of any nature within the radius which might retain them. The consequent conclusion is that, aside from the efficiency and general superiority of the gas-driven compressor for the purpose to which it is ideally adapted in every sense of the word, the steam boiler, with its certain attendant danger, has no place in the equipment of gasoline production from natural gas.

TEXAS AGAIN AFTER CORPORATIONS.

Quite a stir has been created in the Texas legislature by a bill just introduced by State Senator Mayfield. It is aimed at the concerns which have acquired the properties of corporations which were convicted of violating the state's anti-trust laws. According to explanations of the purpose of the bill it would reach the Pierce-Fordyce Oil Association as successor to the Waters-Pierce Oil Company; also the refineries at Corsicana and Beaumont, which were bought in by John Sealy of Galveston. Other concerns might be affected. Concerning its general purpose Senator Mayfield says:

> "This is a bill requiring corporations which have been convicted of the violation of the anti-trust law of Texas and their successors doing business in this state to file with the secretary of state sworn statements of their ownership, as well as the ownership of their bonds and copies of their unrecorded mortgages, and such working agreements as they may have which shall run over a period of one year. The bill provides for jail penalties for failure to make this report and provides for no money fine whatever. It designates those whose duty it is to file this report, and provides that if they do not file it they shall serve a term in jail. It affects no other corporation or co-partnership except those heretofore convicted in this state. It also makes it the duty of the secretary of state to call the attention of county and district attorneys to any violation of this law which they may know of. The number of corporations which have been convicted under the anti-trust law of Texas is rapidly increasing and in each instance it seems as though they have come back into the state, going about doing business in practically the same method as before their conviction. The only change apparent to most people is the change in name. Governor Campbell, before he went out of office, made some reference to this in his speech at San Antonio.

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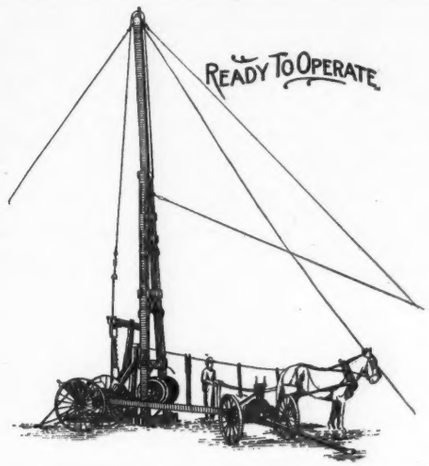

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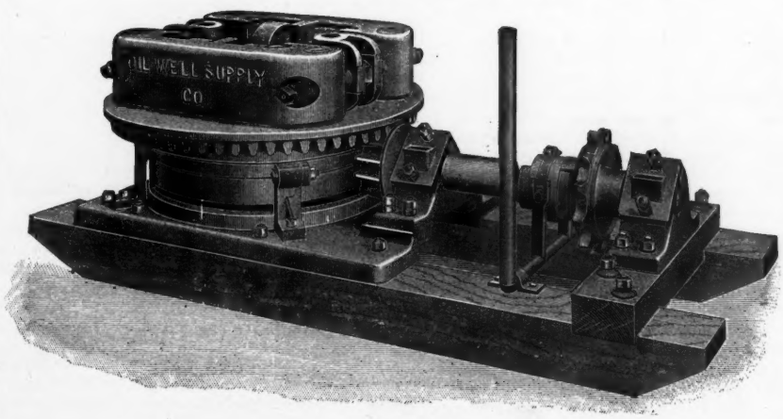

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Foreign Developments in 1910

(Exclusive Correspondence, The Oil and Gas Journal.)

LONDON, Eng., Feb. 1.—Starting this review here in the United Kingdom, it may be said of 1910 that it failed to leave pleasant memories to the large majority of people who invested their savings and surpluses in companies organized to exploit alleged oil lands in the remote ends of the earth. Coming on the heels of the rubber boom, the oil boom has made conservatives of some persons who were unscathed by the rustling rubber foliage. The promoter ran wild for a few months and from five to fifteen oil companies were offered the British investor every day, covering acreage in the United States, Mexico, Trinidad, Roumania, Austria-Hungary, Spain, Egypt, Australia, New Zea land and Africa—indeed, it is barely possible that flotations would have been offered in Mars had the promoters had time to get around to that planet before the clouds obscured it. The most of these companies had no production and many of them only a scant acreage and that was located where oil would be unlikely to rest, but "oil" was the magical word and the far-away field had a romantic and prosperous note. A few of the shares offered and sold are based on production that is profitable and a good investment, but they were pulled down by the thousands of worthless shares, even the best shares losing as much as 20 per cent, so that for the British and European investor the year closed very disappointingly. Maikop flotations, which appeared in flocks, are especially depressed, and a group of Trinidad promotions are coming exceedingly slow. However, the drastic shrinkage in prices makes a normal recovery probable, but "oil in the empire for the empire" is not, just now, the most popular slogan in Great Britain.

Scotch Shale Industry.

The Scotch mineral oil trade has encountered poor roads lately, and it was not helped by the oil boom in England and the flotation of more than one hundred new companies with a total capitalization of nearly $130,000,000 to produce oil in widely distributed parts of the globe. But the industry has hopes for the future, for Scotch producers realize that the new companies that eventually are successful are likely to produce an oil more suited for fuel purposes than for valuable products. The Scotch shale product is a much more complex article than crude oil from drilled wells, as might be imagined from the circumstances of its origin, and it yields by-products that have become much more valuable than lamp oil; in fact, the by-products have saved the Scotch shale oil industry. Scotch companies produce about 22,000,000 gallons of lamp oil annually and it is only at times they have any difficulty in disposing of the full output. The adoption of tank-wagon distribution would, it is believed, stimulate consumption, but the wooden barrel, despite its high cost and other drawbacks, yields to new containers stubbornly. Steel barrels have recently been tried with encouraging results, but the initial cost, about five times that of wooden barrels, has so far confined their use to petrol, or motor spirits. The Scotch companies produce between 20,000 and 25,000 tons of paraffin wax annually, which, until recently, when this trade became greatly depressed, was sold at a splendid profit. Galician oil producers discovered, several years ago, that their oil was rich in wax, and from an output of 5,000 tons in 1904 they have increased to 25,000 tons a year and restricted the trade here. Sulphate of ammonia has been the strong product with Scotch shale producers, the output in 1910 reaching 70,000 tons. This by-product, which at one time was a waste, has risen in price to $65 per ton, an advance of $7.50 a ton during the year. Scotch lubricating and gas oils have declined in price fully $2.50 a ton. It remains to be seen what effect the heavy bounty Australia has just voted to encourage its own shale oil industry will have on the Scotch producers; also the attempt of the English syndicate now exploiting the shale oil trade in New Brunswick, for which it is hoping to secure a fine bounty.

Oil Fields of Russia.

Outside of the United States the greatest oil producing country is, of course, Russia, the producing area located in the Caucasus region and chiefly at two points there, Baku and Grozny. The recently advertised field at Maikop, which may or may not become an important producing district, is not sufficiently developed to say more than that it promises well in a comparatively small area around Maikop. Further north, still in the same region, is the peninsula of Taman and the adjacent territory, where considerable boring has been carried on with indifferent success. Another field of great promise but of little outside interest is the island of Tcheleken, on the eastern shore of the Caspian sea. Farther east again there is the Ferghana field, which, although interesting on its merits, is of only local significance. North of the Caspian sea are the known bitumen and petroleum areas of Samara and contiguous districts. Still farther north, at Uchta, on the Pechor river, is a district of which much is written and heard, but opinion differs widely as to its future. The best that can be said of it is that the Russian government has donated $45,000 toward the expense of investigating and that the tools are already on the ground for boring. It will interest American readers to know that the operators at Uchta have been intrusted to American supervision.

Touching the productiveness of the Russian petroleum areas the reports regarding the Baku district are unfavorable. Baku, as is now ancient history, was very hard hit by the political and industrial disturbances of 1905, when many of the wells were destroyed and the production reduced to a very low level. Since that year there has been an ominously very gradual improvement in the production—ominous, because this improvement has been due to extraordinary efforts on the part of the producers to take as much oil out of the ground as they could as long as the high prices continued because of the scarcity of oil which followed the disturbances. The result has been as it always is—increased production causing lower prices. In 1909 the Russian output was 65,970,350 barrels, nearly 4,000,000 barrels greater than in 1908, starting a surplus and season of declining prices that culminated in 1910 in very unsettled conditions and an effort to restrict the output, which has been partially successful, as the production of Baku in 1910 did not exceed 59,812,500 barrels, 61,287,500 barrels in 1909, 1,475,000 barrels less than in the preceding year, and 58,375,000 barrels in 1908. The year just ended demonstrated that five years of vigorous drilling for new wells and the deepening of old wells to take advantage of the good market have sensibly exhausted a phenomenally rich oil field, and it is now admitted by practically all competent and conservative authorities that the district is giving out. There appears to be only one hope for Baku and that is that the government will permit additional areas to be developed, which might not be productive. A law is now in preparation to permit this.

The Grozny region, which hung fire for many years, has recently developed extraordinary activity and the production, which was estimated to be capable of not to exceed 5,000,000 barrels a year, rose to 7,500,000 barrels in 1909 and reached 8,750,000 barrels in 1910. Thus the shortage of Baku in 1910, compared with 1909, will be more than made up by the increase at Grozny. Considering the Caucasus as one field, 1910 will show a gain over 1909. While Baku and Grozny furnish the Russian production and the increase in one district only about offsets the decrease in the other, the production of Russia in 1910 may be said to have slightly increased, considering the new fields that are being exploited, even though their output has not yet reached commercial channels.

Referring to Maikop again, it promises well, judged by recent results. The field came into prominence by the striking of a gusher in September, 1909, and the eyes of European oil operators and speculators were directed toward Maikop. Companies organized in London followed one another with vertiginous rapidity, locating claims regardless of surveys or lines. Some of these promoted companies have expended large sums of money and begun the active development of their holdings. Quite a number of producing wells are in, but no gushers are noted. The work has been complicated by the Russian mining laws, which make it very difficult for foreigners to act direct. Consequently a good deal of the investment and operating work in the Maikop field is done through Russian houses and representatives, the expedient resorted to being the well-known one of taking a large financial interest in a Russian company already established in the district and in return for such financial interest the alien investor is allowed to direct the operation of the property. Development is hampered for want of communication and transportation facilities and even the present limited production exceeds the means of moving it. Pipe lines are being pushed to completion with all the haste that is possible, seeking to cover the field for gathering and to connect it with tidewater at Tuapse, which has been selected as the export and shipping port for the Maikop district, over a hundred miles of very broken country having to be covered. Tanks are being erected in which to store the oil and for general field purposes, but they have helped little so far. Refineries are also under consideration, and until the railroad that is under construction through the Maikop district and the trunk pipe lines are ready for service the outside world cannot feel the effect of whatever fresh supply of oil the new field may be capable of producing. A French firm named Pershot has been awarded the contract for installing the wharves and general port works at Tuapse, which they are obligated to complete within three years. They may also be called upon to assist in tunneling the mountains for the railway that is to connect the Maikop field with the Black sea. It will thus readily be seen that Maikop cannot easily force itself into the petroleum industry with an unseemly fierceness that might disarrange present plans. Development to date at Maikop strengthens the belief that it is more likely to become a light-oil district, with naphtha as one of the products, than of crude like Baku and the coastal fields.

Tcheleken, the island on the eastern side of the Caspian sea opposite Baku, is known beyond doubt to be rich in bitumen, ozokerite, kir and some petroleum, but little knowledge has yet reached the outside of what is really going on there, except that it is known that the Nobels are systematically and vigorously boring wells, installing tramways and preparing for intelligent development. Several unusually strong wells have been reported during the last few months, one of them flowing 28,000 barrels in 24 hours. It is said that some American capital has been invested there.

Some prominence has recently been given the petroleum development in Turkestan, under the jurisdiction of Russia, at Tchimion, the Ferghana district, but it has not responded, in a way, to its first promise. Its chief use is to furnish liquid fuel to the Central Asia railroad and lighting and heating oils for the local population.

With the partial passing of the Caucasus the petroleum fields of Russia are becoming of less interest, so far as outside capital and interests are concerned. The mention that has already been made of other possible areas is probably all that they merit, at all events for the time being.

Roumania and Galicia.

The only other producing regions in Europe besides Russia that are factors in the industry are Roumania and Galicia, in separate principalities having varying governmental regulations. While the areas involved are indefinitely connected geographically, the Galician product is of higher grade than the Roumanian, the latter running largely to residuals and fuel; in Galicia naphthas are an important feature. In 1909 Galicia was credited with a production of 14,932,799 barrels, and in 1910, while the official figures have not been published, it is safe to say that the field held its own. Roumania, in 1909, produced 9,321,138 barrels and the 1910 output was in round numbers 9,500,000 barrels, showing a slight increase. The Austrian government has undertaken to protect the Roumanian producers, refiners and marketers by the adoption of regulations that prohibit foreign refiners from either importing petroleum or producing and refining it within the boundaries of the field, and all branches of the industry are in a very depressed condition. The increasing production has made a surplus that is hard to distribute in adjoining countries, Turkey furnishing the principal market. Russia contends that the Roumanian product is not equal to the Russian oil and that as soon as conditions are favorable Russian producers and marketers can recover their lost trade in the near eastern markets, especially Turkey, lost when the 1905 disturbances and high prices put Russia out of the running. In other words, as soon as Russia feels fit to seek to recover her lost trade she

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can do so and Roumania will be forced out. These local trade jealousies, however, seem to have handicapped both the Roumanian and the Russian petroleum interests, in their desire, through government interference, to put the Standard Oil Company out of that trade territory. While the dispute was originally with the Standard, the struggle has involved other interests that have superseded Roumanian and Russian claims so that neither does not appear to be in position to do much more than to wait until the cost of transportation has been reduced to almost a gift or until the prospective Black sea fields have been developed to an important and compelling producing stage, a contingency that is many months away, if not years. The Royal Dutch-Shell syndicate, while interested to a considerable extent in Roumania, in order to meet competition is branching out in a way that forces it to meet conditions which force the Roumanian fields more and more into a purely local factor, and until the government regulations and local competitive embarrassments are eliminated or adjusted on a rational commercial basis the Austria-Hungary fields are not likely to take the place their capabilities entitle them to. One hears, today, that the troubles have been adjusted, and tomorrow it will be given out that they are more muddled than ever. In the meantime prices of crude and products have declined until profits have practically disappeared for every interest and caused the report and belief that small producers and manufacturers are dropping out. Some American products, of superior merit, will continue to find a market there, but at prices not as remunerative as could be desired.

Sumatra, Java, Borneo.

These islands, practically under Dutch control, in 1909 produced 11,041,852 barrels of crude petroleum, much of it of a high refining grade, and fixing a base of commercial importance in the Far East that operates against the free distribution of American petroleum. The remoteness and essentially local environment of these fields operate against much familiarity with conditions and development. The operating interests, largely Dutch, are closely protected and have a monopoly. The information obtainable indicates that the 1910 development and production were at least equal to 1909. The producing formations are comparatively shallow, permitting of economical development, and some strong producers are reported. There is reason to believe that active operations with modern facilities could increase the production.

The Indian Fields.

The Burma fields in India have been gradually extending and the production is increasing, with what up to a recent period has been a virtual monopoly for the English interests. During 1910 three outside companies, not exactly foreign, but distinct from the old company, secured concessions and have been making preparations for active development, one of them having already begun work some months ago in one of the outlying areas. In 1909 India produced 6,676,517 barrels of crude oil, practically all from the province of Burma, having a value of $4,429,352. The total imports of petroleum products in India for that year (1910 figures not yet being available) amounted to 70,514,379 imperial gallons, a fraction more than the American gallon, and 71,698,635 gallons of native product was marketed, showing the trade to be very evenly divided, with American petroleum claiming 39,547,142 gallons of the imports. Since 1907 there has been an increase of about 1,000,000 barrels annually in the output of India and our advices are that the 1910 production has increased at the normal ratio and is now fully 20,000 barrels a day exclusive of the oil produced locally by individual land-owners for home use, a right reserved to all lessors when desired. The petroleum industry in India is in a healthy condition, free from many of the embarrassments that surround the European fields.

Japanese Fields.

The oil areas in Japan are made up of very broken formations, of varying depths and grades, and difficult to operate. It is doubtful if any other people than the Japanese could maintain development at any profit, if they eventually derive any themselves, and the industry there is now almost a government affair. In 1909 the total production, 2,012,409 barrels, fell slightly below that of 1908, and the best information is that in 1910 it certainly had not increased and probably was a trifle under that of 1909 and operated almost on the truck-garden plan. The Standard Oil Company, while reserving some acreage in the northern part of the islands, practically withdrew from active development work in Japan under a trade agreement with the principal operating company or syndicate of Japanese, and increasing quantities of American crude have been imported for local refining and fuel use, California furnishing most of it, although in 1910 two full cargoes of crude went to Japan, in Japanese vessels, from Port Arthur, Texas, as a trial order for refining.

Development in Peru.

During the last twenty years American and Italian prospectors have been wildcatting along the Peruvian and Bolivian coast, finding some oil, and a small refinery was installed years ago, but no production of importance was developed. The scattered operations, however, discovered formations, seepages and evidences of petroleum that promised profitable exploitation. Within two years, or beginning with 1907, to be exact, many concessions have been granted for development and about 600 wells have been drilled, the production from which in 1909 amounted to 1,316,118 barrels, and it is thought to have increased some in 1910. The Titicaca Oil Company, an American concern, has secured concessions and is actively developing them in the province of Huancane, near Pusi, in the southern part of Peru, the earlier and more important development having been in the Lobitos, Negritos and Zorritos districts in the northern part. As early as 1907, 4,581 concessions had been granted by the government. There are about 80 producing wells in the Lobitos district, from which, in 1909, 429,195 barrels were produced, the Negritos production for that year being 740,070 barrels, and that of the Zorritos district 70,750 barrels. The crude is of good refining value and a considerable per cent of it is shipped to California refineries and exchanged for fuel oil.

Canadian Development.

The oil fields of Canada hardly come under the foreign head, as American operators and capital have been such an important factor in the discovery and development that they are practically home fields, although American operators have about abandoned hope of any profit there, even with a government bounty of 32 cents. The high record of Canadian production was in 1900, when it reached 913,498 barrels of 35 imperial gallons, gradually declining until 1907, when an influx of American operators and money produced 788,872 barrels, but in 1909 the total production had fallen to 420,755 barrels, with the prospect for 1910 still less and very little interest manifested. During 1910 some excellent gas territory was opened, near Moncton, New Brunswick, with some oil showing, and the natural gas industry of Canada is attracting attention, with prospects for profitable development. In the same province an English syndicate has been prospecting for several years along the northeast coast, with evidences of oil and gas, under the superintendency of O. P. (Jack) Boggs, a well known American operator. Another English syndicate is beginning the development of the shale oil industry in New Brunswick.

Foreign Prospecting.

Outside of Germany, which claims an annual production of 1,000,000 barrels of crude, scattered in Alsace-Lorraine and the outcroppings of the Galician fields, Egypt, along the Red sea, and Persia seem to be attracting as much attention from prospectors and promoters as any other part of the globe. The island of Trinidad, under the exploitation of English syndicates, with American superintendents, promises some asphalt oil production, the latest consular report claiming a 3,000-barrel well. In the Orange river country in South Africa, in Algiers, the northern part, and at Nigeria, on the west coast, there is prospecting, but nowhere outside of the Red sea and the Persian development has any production of commercial importance been discovered.

FOREIGN PRODUCTION, 1910.

Country.	Barrels.
Russia	66,000,000
Galicia	15,000,000
Sumatra, Java, Borneo	11,000,000
Roumania	9,500,000
India	7,500,000
Mexico	4,000,000
Japan	2,000,000
Peru	1,400,000
Canada	400,000
Germany and all others	1,500,000
Total	117,800,000

The Year in Refined

Review of Petroleum Exports and Market Range

By CHARLES NORDHAUS, Jr.

NEW YORK, Feb. 15.—(Special.)—The year 1910 in the petroleum industry has been a most eventful as well as a strenuous one to producers and refiners, both here and in foreign markets the world over. The extraordinary increase in the world's production of petroleum, which stimulated keen competition by an effort to find an outlet for the enormous supply, led to sharp successive cuts in prices for illuminating oil for export. Foreign oil companies have been cutting prices in all countries of the globe and toward the latter part of the year the situation became acute, with prices having touched the lowest level for illuminating oil in the history of the industry. From present indications the petroleum war will be prolonged and American refiners will increase their sales of by-products of petroleum regardless of prices to maintain their supremacy in the oil business in the markets abroad, which has been built up by them at an enormous expense. Notwithstanding the active and drastic intervention of foreign governments in hostility to American petroleum, having practically shut out the latter from entering into business in several leading foreign countries, American oil interests continue to hold their own, and, as near as can be learned, are steadily gaining on their competitors. At the present writing there is little change in the general condition of the petroleum industry of the world, but America bids well to hold its position. The struggle is a serious one that will spell ruin somewhere, and it is difficult to forecast at what further sacrifice of prices. The American refiners and producers have not yet suffered financial losses, while the Roumanian and Russian producers are being forced to the wall.

The Shell Trading and Transport Company has been able to find a market for 50,000 tons of gasoline in the United States, and several cargoes were delivered direct to New Orleans and San Francisco from Sumatra, which were reported to have been purchased by the Standard Oil Company. The Royal Dutch-Shell group, the most formidable competitors to American refiners, is placing oil in France and intends to sell benzine in the United States, having shipped oil by four large tank steamers to Boston. At Singapore competition between the American and Dutch-Shell groups has led to consecutive cuts in prices of illuminating oil throughout the Far East. This led to increased consumption, consumers, taking advantage of the low prices, laying in good stores in hope of future profits.

The first shipment of American petroleum to Smyrna arrived there early in the year, shipped by the Standard Oil Company, the cargo consisting of 100,000 cases of illuminating oil, which was stored for distribution to the trade. Later shipments of oil were mostly in bulk and tanked on arrival. It is reported that approximately $1,000,000 will be spent in the Smyrna region, as the needs of the trade expand.

In Germany American oil exporters are holding their own, despite the difficulties confronting them in the Roumanian and Galician fields. The Austrian oils have lost ground during the year, while in the Italian market American oil shows a gain, which is also noted in the Japanese and the United Kingdom markets. The settlement of the tariff imbroglio on petroleum, which threatened the trade relations of this country and France, brought about a resumption of business with the latter country which was held in abeyance by the enforcement of the maximum rates against American oil importations. The canceling of an agreement between the Standard Oil Company and the Asiatic Petroleum Company, Limited, led to a price war in Japan. As the Japanese companies supply the smaller part of the product they are suffering severely and complaining of the situation in which they find themselves.

Another American oil victory was a satisfactory agreement reached between the Vacuum Oil Company, an American corporation, and the Austro-Hungarian minister of finance in the controversy

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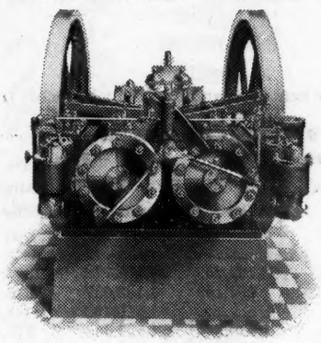

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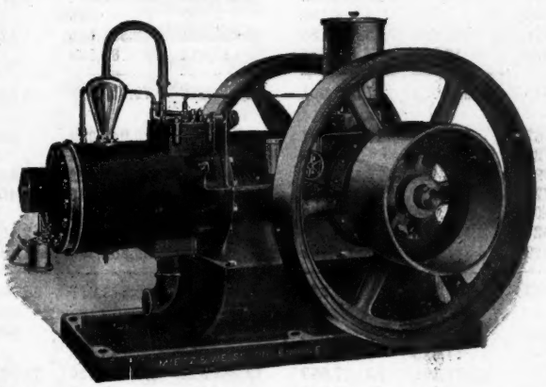

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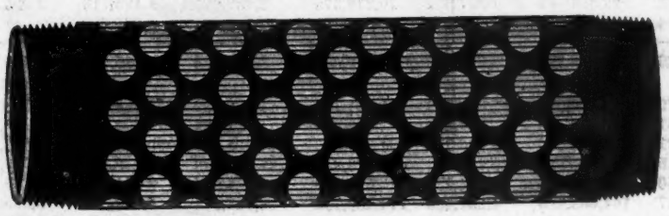

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between that company and oil concerns controlled by Austro-Hungarian capitalists, removing restrictions upon the American concern, which heretofore compelled it to close down its refineries and stop buying crude oil.

A similar controversy is threatened in Roumania, where an American oil company is a formidable competitor with Roumanian oil interests. The Royal Dutch Petroleum stock is flat because of fears of the outcome in the present trade contest. The latter company and an American oil concern are invading new territory as a result of a battle over the control of the French market. Late in August the first arrival of a full cargo of Russian gasoline from Antwerp at Philadelphia was looked upon as curious, considering that Pennsylvania was once the greatest oil-producing region in the world and Philadelphia the great distributing point. The cargo of oil was landed by the steamer Roumania and came from Russia, having been refined in Antwerp. It was of fine grade, suitable for automobiles, and ready to place on the market without further treatment.

Gasoline production has reached enormous proportions. Home requirements reflect the spectacular growth of the automobile, motor boat, etc., trade. Gasoline has had a stimulating influence in the production of illuminating oils, as only a small proportion of gasoline can be extracted from a barrel of crude petroleum, the larger product by far being illuminant. The feature in the export market for the year 1910 was the maintenance of prices on naphtha, gasoline and benzine, which underwent no quotable change. This was equally true of lubricating oils of standard brands. The output of gasoline has doubled in six years and for 1910 shows a much larger expansion. In 1909 the production of gasoline, including all oil refineries of this country, amounted to 9,600,000 barrels, 50 gallons to a barrel, which was not adequate to meet the domestic requirements and led to importations of several full cargoes of the product.

The introduction of fuel oil in the United States navy has been rapid and results have been fully as good as expected. Ocean steamship lines are building vessels equipped for burning fuel oil. Various railroad lines have adopted fuel oil for burning and prospects for an increasing demand are very promising.

Th active demand for gasoline and the comparative high price for it has to a large extent enabled American refiners to market illuminating oil for export on a narrow margin of profit.

Prices for Refined Oil.

With the opening of the year prices in the New York market for refined in bulk, cargo lots, New York and Philadelphia loading, opened at 4.55c and 6.05c per gallon for standard and water-white oils, respectively. On January 7 quotations were lowered 15 points, to 4.40c and 5.90c per gallon, followed by a further reduction of 15 points on April 8, to 4.25c and 5.75c per gallon for standard and water oils, respectively. On June 11, prices were again lowered 10 points, to 4.15c and 5.65c, followed by another reduction of 15 points, to 4c and 5.50c per gallon for standard and water-white oils, respectively. On October 6 standard white oil was lowered 10 points, to 3.90c, while water-white oil was re-

EXPORTS OF MINERAL OILS.

This statement includes only exports of mineral oils from the customs districts named, and embraces about 96 per cent of the mineral oils exported from all ports during the periods indicated.

ARTICLES AND CUSTOMS DISTRICTS FROM WHICH EXPORTED.	DECEMBER— 1909 Quantities. Gallons.	1909 Values. Dollars.	1910 Quantities. Gallons.	1910 Values. Dollars.	TWELVE MONTHS ENDING DECEMBER— 1908 Quantities. Gallons.	1908 Values. Dollars.	1909 Quantities. Gallons.	1909 Values. Dollars.	1910 Quantities. Gallons.	1910 Values. Dollars.
CRUDE:										
Baltimore	.....	.....	.....	.....	.....	.....	47	6	.....	.....
Boston	.....	.....	.....	.....	175,490	9,427	.....	.....	.....	.....
New York	2,376,562	147,315	4,775,417	239,199	36,547,123	2,301,040	35,370,334	2,166,239	36,101,722	1,887,411
Philadelphia	302,000	28,448	.....	.....	25,230,944	1,743,547	10,907,686	802,100	4,468,057	345,279
Galveston	.....	.....	.....	.....	51,035	2,317	.....	.....	1,910,483	48,051
Port Arthur and Sabine	2,707,964	60,352	1,664,638	27,744	23,748,954	678,903	37,044,415	1,030,344	14,527,965	371,495
San Francisco	4,746,000	67,800	5,713,804	81,752	13,693,400	225,640	44,917,441	670,587	62,621,932	920,016
Total	10,132,526	303,915	12,153,859	348,695	99,446,946	4,960,874	128,239,923	4,669,276	119,630,159	3,572,252
NAPHTHAS:										
Baltimore	.....	.....	.....	.....	32,425	8,481	18,434	2,767	37,500	8,151
Boston	.....	.....	1,744	238	47,516	6,685	43,005	5,830	39,426	5,430
New York	1,915,851	186,908	3,561,364	362,003	17,750,261	2,255,004	37,712,821	3,184,669	55,655,027	4,881,905
Philadelphia	337,435	52,723	4,503,141	279,420	16,897,562	1,422,867	15,985,705	1,349,355	20,862,394	1,399,866
Galveston	.....	.....	.....	.....	250	37	6,100	1,105	45	9
Port Arthur and Sabine	1,119,932	67,197	.....	.....	1,472,970	103,646	3,695,780	253,701	2,381,616	173,283
San Francisco	8,624	1,718	6,462	1,376	91,434	12,839	93,216	17,071	83,520	17,042
Total	3,381,842	308,546	8,072,711	643,037	36,292,418	3,809,559	57,555,061	4,814,498	79,059,528	6,485,686
ILLUMINATING:										
Baltimore	13,330	1,330	.....	.....	11,271,567	658,941	10,695,991	642,472	6,943,273	360,707
Boston	2,773	306	19,215	1,840	196,722	24,386	175,405	21,267	129,906	13,366
New York	45,650,924	3,322,347	49,087,269	2,901,670	646,872,094	48,449,495	616,183,294	44,288,460	575,878,402	37,530,606
Philadelphia	25,607,873	1,427,320	26,251,829	1,248,836	339,507,776	20,465,249	302,795,972	17,360,414	266,969,325	13,460,502
Galveston	.....	.....	.....	.....	50,106	5,375	13,510	1,437	352	67
Port Arthur and Sabine	4,759,923	214,196	.....	.....	52,988,531	2,434,379	60,584,865	2,808,127	52,166,055	2,495,826
San Francisco	2,123,991	88,127	2,831,154	105,298	69,751,619	3,344,457	49,293,182	2,201,659	30,256,304	1,193,010
Total	78,158,814	5,053,626	78,189,467	4,257,644	1,120,638,415	75,382,282	1,039,742,219	67,323,836	932,343,617	55,054,084
LUBRICATING AND PARAFFIN:										
Baltimore	389,010	54,241	523,304	75,879	4,440,400	682,023	5,100,686	746,498	6,037,623	861,290
Boston	8,247	1,415	15,697	4,013	225,499	41,583	217,863	40,788	199,499	37,624
New York	8,498,697	1,172,007	7,880,211	1,103,299	94,612,863	12,879,191	99,517,999	13,261,922	100,415,326	13,937,393
Philadelphia	5,745,180	570,871	4,142,492	393,820	43,698,080	4,634,629	48,475,280	4,682,042	50,419,517	4,861,179
Galveston	92,147	18,569	76,887	16,400	217,939	46,528	511,450	74,085	943,877	191,275
Port Arthur and Sabine	22,811	2,962	.....	.....	1,038,261	73,000	2,849,277	187,817	317,169	26,736
San Francisco	29,208	7,301	35,579	9,958	379,905	105,254	475,359	109,465	533,665	129,424
Total	14,785,300	1,827,366	12,674,170	1,603,369	144,612,947	18,462,208	157,147,914	19,102,617	158,866,676	20,044,921
RESIDUUM:										
Baltimore	.....	.....	.....	.....	8,434,704	337,387	5,896,545	230,489	.....	.....
Boston	.....	.....	.....	.....	644,832	22,202	424,967	13,997	63,600	2,549
New York	34,094	2,828	444,654	10,420	1,682,976	82,128	2,965,411	120,510	22,348,432	654,823
Philadelphia	4,708,927	172,966	1,870,271	50,839	34,663,273	1,224,596	34,512,290	1,166,191	24,257,035	718,568
Port Arthur and Sabine	6,520,578	225,824	1,580,668	55,323	28,359,769	997,552	70,276,395	2,432,085	58,195,713	1,998,250
San Francisco	.....	.....	627	44	44,231	2,815	34,381	2,691	2,230,680	40,186
Total	11,263,599	401,618	3,896,220	116,626	73,829,785	2,666,680	114,109,989	3,965,963	107,095,460	3,414,376
TOTAL MINERAL OILS:										
Baltimore	402,340	55,571	523,304	75,879	24,179,096	1,686,832	21,711,703	1,622,232	13,018,396	1,230,148
Boston	11,020	1,721	36,656	6,091	1,290,059	104,283	861,240	81,882	432,431	58,969
New York	58,476,128	4,831,405	65,748,915	4,616,591	797,465,317	65 966,858	791,749,859	63,021,800	790,398,909	58,892,138
Philadelphia	36,701,415	2,252,328	36,767,733	1,972,915	459,997,635	29,490,888	412,676,933	25,360,102	366,976,328	20,785,394
Galveston	92,147	18,569	76,887	16,400	319,330	54,257	531,060	76,627	2,854,757	239,402
Port Arthur and Sabine	15,131,208	570,531	3,245,306	83,067	107,608,485	4,287,480	174,450,732	6,712,074	127,588,518	5,065,590
San Francisco	6,907,823	164,946	8,587,626	198,428	83,960,589	3,691,005	94,813,579	3,001,473	95,726,101	2,299,678
Total	117,722,081	7,895,071	114,986,427	6,969,371	1,474,820,511	105,281,603	1,496,795,106	99,876,190	1,396,995,440	88,571,319

NOTE.—According to the Census of 1905 the percentage of distribution of crude pertoleum among the several products was as follows: Burning oils, 61 per cent; residuum, 5.7 per cent; paraffin oils, 2.9 per cent; paraffin wax, 1.4 per cent; reduced oils, 7.7 per cent; naphtha and gasoline, 10.3 per cent; neutral filtered oils, 0.9 per cent.

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GENERAL OFFICES: CHICAGO

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duced 60 points, to 4.90c per gallon, narrowing the margin of 1½c per gallon between standard and water-white oils to 1c per gallon. This, it was explained by refiners, was done to stimulate the consumption of water-white oil. No further changes were made, with prices closing unchanged on December 31.

The following tabulated figures give the comparative official export prices and fluctuations, quoted in cents per gallon, for refined petroleum in bulk, standard and water-white oils, cargo lots, New York or Philadelphia loading, delivered vessel free on board:

	1910			
	S. W.		W. W.	
	High.	Low.	High.	Low.
January	4.55	4.49	6.05	5.90
February	4 40	4.40	5.90	5.90
March	4.40	4.40	5.90	5.90
April	4.40	4.25	5.90	5.75
May	4.25	4.25	5.75	5.75
June	4.25	4.15	5.75	5.65
July	4.15	4.15	5.65	5.65
August	4.15	4.15	5.65	5.65
September	4.15	4.00	5.65	5.50
October	4.00	3.90	5.50	4.90
November	3.90	3.90	4.90	4.90
December	3.90	3.90	4.90	4.90

Oil in Barrels.

Transactions in barreled refined oil were moderate, showing a further decrease compared with those for the year 1909. This was attributed to losses to buyers, due to leakage from barrels, and steel barrels are now being introduced by several leading manufacturers. On January 1, 1910, prices of barreled refined oil were quoted at 8.05c and 9.55c per gallon, followed by a decline of 15 points to 7.90c and 9.40c on January 7 for standard and water-white oils, cargo lots. This was followed by a further reduction of 15 points to 7.75c and 9.25c on April 8, with prices again lowered 10 points to 7.65c and 9.15c on June 11, for standard and water-white oils. The next reduction was made on September 2, quotations being lowered 15 points to 7.50c and 9c, followed by a further decline on October 6, covering 10 points, on standard white to 7.40c and 60 points on water-white to 8.40c per gallon. These quotations remained unchanged up to the close of the year.

The following table gives the official export prices on refined barreled oil, New York or Philadelphia loading, cargo lots, quoted in cents per gallon, standard and water-white oils, delivered vessel free on board:

	1910			
	S. W.		W. W.	
	High.	Low.	High.	Low.
January	8.05	7.90	9.55	9.40
February	7.90	7.90	9.40	9.40
March	7.90	7.90	9.40	9.40
April	7.90	7.75	9.40	9.25
May	7.75	7.75	9.25	9.25
June	7.75	7.65	9.25	9.15
July	7.65	7.65	9.15	9.15
August	7.65	7.65	9.15	9.15
September	7.65	7.50	9.15	9.00
October	7.50	7.40	9 00	8.40
November	7.40	7.40	8.40	8.40
December	7.40	7.40	8.40	8.40

For small lots of barreled refined oil for export the quotation on January 1, 1910, was 9.25c. On January 7 quotations receded to 9.15c, followed by a further reduction of 25 points, to 8.90c on June 11. The next reduction covered 15 points, to 8.75c, on September 2, culminating with a decline of 50 points, down to 8.25c per gallon, for standard white, which official quotation remained intact on December 31. A corresponding reduction in water-white oils was also made.

Market for Case Oil.

The demand for refined in cases has been exceptionally good, due in part to buyers diverting their purchases of barreled refined to cases, owing to the heavy loss by leakage in the former containers. On January 1, 1910, prices opened up at 10.45c and 11.95c, followed by a reduction on January 7 covering 15 points, to 10.30c and 11.80c per gallon for full cargo lots of standard and water-white oils. This was followed by a further reduction on April 8 of 15 points, to 10.15c and 11.65c, and on June 11 covering 10 points, to 10.05c and 11.55c per gallon for standard and water-white. On September 2 quotations were again reduced 15 points, to 9.90c and 11.40c, followed by a further decline on October 6, covering 50 and 100 points, bringing prices down to 9.40c and 10.40c per gallon for standard and water-white. On October 14 prices were reduced 50 points to 8.90c and 9.90c, with the latter quotations remaining unchanged up to the close of the year.

The following table gives the official export prices on refined in cases (each case containing two 5-gallon cans, 110 fire test oil), cargo lots, quoted in cents per gallon, standard and water-white oils, delivered New York or Philadelphia, free on board:

	1910			
	S. W.		W. W.	
	High.	Low.	High.	Low.
January	10.45	10.30	11.95	11.80
February	10.30	10.30	11.80	11.80
March	10.30	10.15	11.80	11.65
April	10.15	10.15	11.65	11.65
May	10.15	10.15	11.65	11.65
June	10.15	10.05	11.65	11.55
July	10.05	10.05	11.55	11.55
August	10.05	10.05	11.55	11.55
September	10.05	9.90	11.55	11.40
October	9.90	8.90	11.40	9.90
November	8.90	8.90	9.90	9.90
December	8.90	8.90	9.90	9.90

The Market for Products.

The feature in the market for petroleum products was the continued firmness in prices owing to the active demand, which exceeded the output of all the refineries in the United States. Transactions for the year in benzine and gasoline were again as large as in the year 1909, while in naphtha a good gain over the total for last year is noted. An unusual incident witnessed was that no official changes in prices for the above products for export were effected during the year, while in 1909 fluctuations were numerous. In lubricating oils a few changes were recorded early in the year, but quotations were steadily maintained on standard brands of high grades of lubricants, in sympathy with an exceptionally good demand, transactions for the year being equal to those for 1909.

The introduction of fuel oil in the United States navy shows rapid strides and its use by battleships and other vessels has reached the expectation of both producers and refiners. Indications now point to a rapid increase in the consumption of fuel oil for general uses, and railroad lines and large ocean steamship companies will no doubt be large consumers of this oil during 1911.

Official Quotations.

The following tables give the official high and low export prices of various petroleum products, in lots of 200-cases, cans, delivered vessel f. o. b. New York, for each month of 1910, quoted in cents per gallon:

NAPHTHA.

	73@76°		Stove		Auto, 68@72°	
	H.	L.	H.	L.	H.	L.
January	21¼	21¼	14¼	14¼	18¼	18¼
February	21¼	21¼	14¼	14¼	18¼	18¼
March	21¼	21¼	14¼	14¼	18¼	18¼
April	21¼	21¼	14¼	14¼	18¼	18¼
May	21¼	21¼	14¼	14¼	18¼	18¼
June	21¼	21¼	14¼	14¼	18¼	18¼
July	21¼	21¼	14¼	14¼	18¼	18¼
August	21¼	21¼	14¼	14¼	18¼	18¼
Septemter	21¼	21¼	14¼	14¼	18¼	18¼
October	21¼	21¼	14¼	14¼	18¼	18¼
November	21¼	21¼	14¼	14¼	18¼	18¼
December	21¼	21¼	14¼	14¼	18¼	18¼

	BENZINE, 59@62°		GASOLINE, 86°	
	H.	L.	H.	L.
January	12¼	12¼	23¼	23¼
February	12¼	12¼	23¼	23¼
March	12¼	12¼	23¼	23¼
April	12¼	12¼	23¼	23¼
May	12¼	12¼	23¼	23¼
June	12¼	12¼	23¼	23¼
July	12¼	12¼	23¼	23¼
August	12¼	12¼	23¼	23¼
September	12¼	12¼	23¼	23¼
October	12¼	12¼	23¼	23¼
November	12¼	12¼	23¼	23¼
December	12¼	12¼	23¼	23¼

Prices on 10-gallon drums, 200 cases, computed in cents per gallon, delivered free on board New York:

	73@76°		Stove.		Auto, 68@72°	
	H.	L.	H.	L.	H.	L.
January	25¾	25¾	18¾	18¾	22¾	22¾
February	25¾	25¾	18¾	18¾	22¾	22¾
March	25¾	25¾	18¾	18¾	22¾	22¾
April	25¾	25¾	18¾	18¾	22¾	22¾
May	25¾	25¾	18¾	18¾	22¾	22¾
June	25¾	25¾	18¾	18¾	22¾	22¾
July	25¾	25¾	18¾	18¾	22¾	22¾
August	25¾	25¾	18¾	18¾	22¾	22¾
Septemter	25¾	25¾	18¾	18¾	22¾	22¾
October	25¾	25¾	18¾	18¾	22¾	22¾
November	25¾	25¾	18¾	18¾	22¾	22¾
December	25¾	25¾	18¾	18¾	22¾	22¾

	BENZINE, 59@62°		GASOLINE, 83°	
	H.	L.	H.	L.
January	17	17	30¼	30¼
February	17	17	30¼	30¼
March	17	17	30¼	30¼
April	17	17	30¼	30¼
May	17	17	30¼	30¼
June	17	17	30¼	30¼
July	17	17	30¼	30¼
August	17	17	30¼	30¼
September	17	17	30¼	30¼
October	17	17	30¼	30¼
November	17	17	30¼	30¼
December	17	17	30¼	30¼

Price Range Abroad.

Quotations covering American refined petroleum, in barrels, standard white oil, ex-wharf in London, Liverpool and Bremen, gradually declined, due to active, keen competition with foreign refined oil in the oil fields abroad. The fierce struggle between American refiners and foreign oil syndicates for the supremacy of the oil business in the European markets is not fully reflected in the fluctuations in official quotations, which have been secretly shaded. On January 1, 1910, the London and Liverpool markets were quoted at 5½d and 5¼d, respectively. This was followed by a decline in July to 5⅜d and an advance in August to 5⅞d in London, with the Liverpool price pegged up to 5⅝d. Early in September quotations were posted at 5¾d and 5½d in London and Liverpool, followed by a decline, bringing prices down to 5⅝d and 5⅜d, which quotations remained unchanged up to the close of the year. In Antwerp the price on January 1 was 22 francs, followed by a decline down to 19.50 francs late in April and reduced to 19.25 francs in June, culminating in a further reduction that brought the quotation down to 19 francs in July, which price remained unchanged up to the close of the year. Bremen opened at 6.25 marks on January 1, followed by a reduction to 6 marks late in April, with the latter quotation remaining unchanged on December 31.

The following tables give the fluctuations of prices in the principal European markets for American refined petroleum in barrels, standard white oil, and high and low prices for each month in 1910:

	LONDON, pence.		LIVERPOOL, pence.	
	High.	Low.	High.	Low.
January	5½	5½	5¼	5¼
February	5½	5½	5¼	5¼
March	5½	5½	5¼	5¼
April	5½	5½	5¼	5¼
May	5½	5½	5¼	5¼
June	5½	5½	5¼	5¼
July	5½	5⅜	5¼	5¼
August	5⅞	5⅝	5⅝	5⅝
September	5¾	5¾	5½	5½
October	5¾	5⅝	5½	5⅝
November	5⅝	5⅝	5⅝	5⅝
December	5⅝	5⅝	5⅝	5⅝

	ANTWERP, francs.		BREMEN, marks.	
	High.	Low.	High.	Low.
January	22.00	22.00	6.25	6.25
February	22.00	22.00	6.25	6.25
March	22.00	22.00	6.25	6.25
April	22.00	19.50	6.25	6.00
May	19.50	19.25	6.00	6.00
June	19.25	19.25	6.00	6.00
July	19.25	19.00	6.00	6.00
August	19.00	19.00	6.00	6.00
September	19.00	19.00	6.00	6.00
October	19.00	19.00	6.00	6.00
November	19.00	19.00	6.00	6.00
December	19.00	19.00	6.00	6.00

Vessel Charters.

For the year 1910, the total charters of oil carriers show a falling off, but despite this fact rates show an average gain of about 4½c a case over those for the preceding year. This was attributed to a scarcity of suitable vessels constructed for oil shipping and also due in part to slow shipping from abroad, which led to a large number of oil boats lying idle in the Tyne river, England. The fact that some of these vessels were not used had no particular significance, because all foreign shipping was slow and these boats being constructed in such manner that they can only be used for the shipment of oil and therefore can not load any other kind of freight. This led to shipments of case oil by general cargo steamers. For 1910 the total charters, covering petroleum in bulk, barrels, cases, etc., reduced to crude equivalent, aggregated 24 786,646 barrels, with a monthly average of 2,065,554 barrels, showing a shrinkage of 1,292,230 barrels and 107,685 barrels, respectively, compared with the total figures for 1909.

The following table gives the total charters of vessels for exporting petroleum from the ports of New York and Philadelphia, Baltimore and Boston, covering refined naphtha, etc., in bulk, barrels, cases, etc., reduced to crude equivalent, compiled in barrels of 50 gallons each, with comparative figures and monthly averages:

	1910.	1903.	1908.
January	1,729,459	2,114.778	2 647.247
February	1,672,755	2.035,508	2,765,436
March	2 096 910	2,426,247	2,421 521
April	2,025,049	2,132.853	2.259,420
May	2,386,520	1,970 083	2.230,532
June	2,316,747	1.952.265	2,389,219
July	1,724.930	2.658,433	2,008,439
August	2,112.017	2,240.902	2,775,538
September	2,086,639	2.617 311	2.229,042
October	2.041,274	2,111,875	2,481,488
November	2,534.143	2 002.418	1,984,715
December	2,060,203	1,806,203	2,644,488
Total	24,786,646	26,078 876	28 837,085
Average	2,065,554	2,173,239	2,403,090

The Total Clearances.

Reviewing the clearances of petroleum at the port of New York, compiled in gallons, substantial

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The Texas Company

GENERAL OFFICES: HOUSTON, TEXAS

EUROPEAN OFFICES: LONDON and ANTWERP

EXPORT DEPARTMENT: WHITEHALL BUILDING NEW YORK

gains for the year 1910 over 1909 are noted for benzine and residuum, while there were slight increases for gasoline, also mineral oils, and a fair gain for naphtha. For refined a fairly large shrinkage is noted and for crude and lubricating oils slight decreases. Total exports of mineral oils from the United States for the year 1910 aggregated about 1,396,955,440 gallons, valued at $88,571,319. This shows a shrinkage of 99,799,666 gallons and a decrease in value of $11,304,871, compared with totals for 1909. The lowest values were partly due to keen competition in European markets, surplus stocks of principally illuminating oils and also the development of oil in the Mexican fields, which resulted in a substantial decrease in business from the Gulf ports. The exports of illuminating oil from the United States for the year 1910 are valued at $55,600,000, showing a decline in value of $12,000,000 compared with that for 1909, while lubricating oil exports are valued at $20,900,000, showing a gain in value of $900,000 compared with that for the year 1909.

The following table gives the total clearances at the port of New York, covering crude petroleum, refined, naphtha, etc., compiled in gallons, for the year 1910, with comparative figures:

	1909.	1910.
Refined	603,110,896	556,586,432
Crude	37,837,933	37,487,162
Naphtha	38,142,499	55,852,666
Residuum	3,221,736	21,098,540
Benzine	3,649,060	6,237,544
Gasoline	19,199,583	21,101,794
Lubricating	85,906,946	85,559,805
Mineral oils	2,539,205	2,880,307
Total	793,607,858	786,804,250

CALIFORNIA EXPORTS.

By A. R. HINTON.

SAN FRANCISCO, Cal., Feb. 5.—(Special.)—The total value of California crude oil and all manufactured products, including asphalt, exported from this customs district, including Port Harford and Monterey, in 1910, amounted to $2,095,651, as follows: Refined by-products, $1,335,950; fuel (crude and residuum), $741,254; asphalt, $18,442.

Fuel exports amounted to 1,543,850 barrels (1,442,266 barrels crude, 101,584 barrels residuum), the greatest amount by far ever handled. The Panama canal and railroad took more than 50 per cent of this and the Chilian nitrate works and railroad within a fraction of 32 per cent of the whole. All this trade, with that of Guatemala, was in the hands of the Union-Agency companies.

A feature of the year was the growing Peruvian demand. This is handled by companies in that country, where wells of high gravity oil come in with a big initial production. The companies operate their own vessels and export their light crude to California, where it is in demand for refining, and import crude or residuum for fuel. The export of residuum is a new thing in California, due probably to increased refining operations, especially by the Union Oil Company, which has enlarged the supply of residuum.

The exports of refined products are much less than two years ago and a still greater decline from those of three and four years ago. This is due to the competition of Oklahoma high-grade oils, manufactured in the East and shipped via the Suez canal. The decline is especially marked in the Chinese trade in illuminants. The Japanese trade has grown in the last two years enormously, but does not offset the Chinese loss. Shipments to Spanish-America increased some.

The asphalt exports, in quantity, date from 1910. No record is kept of the number of tons. Canada took large amounts, which went chiefly into British Columbia, Alberta, Manitoba and all the growing Northwest, some, however, going east, even to the Atlantic coast. The figures include only what has gone by water from this port, there being no record accessible of rail shipments direct. There were also substantial shipments to Germany and Japan and one to Argentine.

The total exports shows a marked decrease from 1909. Following are the complete tables:

FUEL OIL—Barrels of 42 Gallons.

Destination.	Crude.	Residuum.	Total Fuel Oil.	Total Values.
Chili	444 852	48,635	493,487	$76,555
German Oceanica	52	.....	52	66
Guatemala	116,000	.....	116 000	69,600
Panama	773 619	.....	773,619	465,600
Peru	107,717	52,949	160,666	129,405
Salvador	26	.....	26	33
Totals	1,442,266	101,584	1,543,850	$741,259

REFINED—In Gallons.

Destination.	Naphthas.	Illuminants.	Lubricants.	Totals.
Australia	.....	.....	42,250	42,250
Asiatic Russia	.....	.....	211	211
Canada	.....	.....	287,265	287,265
China	.....	4,450,000	5	4,450,005
Chili	.....	20	11,234	11,254
Colombia	4,188	.....	200	4,388
Costa Rica	15,283	520	500	.....
Dutch East Indies	.....	.....	50	50
Ecuador	1,073	.....	.....	1,073
French Oceanica	31,816	9,220	3,540	44,576
German Oceanica	100	.....	.....	100
Guatemala	641	112,050	14,004	126,695
Honduras	4,434	27,650	114	32,198
Hong Kong	.....	2,130,633	6,500	2,137,133
Japan	7,944	23,272,766	40,828	23,321,548
Mexico	80	38,025	78,906	117,011
Nicaragua	2,808	137,950	1,428	142,186
New Zealand	.....	.....	28,775	28,775
Oth. Brit. Oceanica	.....	1,300	998	2,298
Panama	616	1,200	2,845	4,661
Peru	312	.....	1,254	1,566
Philippines	.....	.....	9,210	9,210
Salvador	10,354	42,535	4,689	57,578
Totals	79,649	30,223,879	534,806	30,838,334

VALUES.

Destination.	Naphthas.	Illuminants.	Lubricants.	Totals.
Australia	.....	.....	$ 12,480	$ 12,480
Asiatic Russia	.....	.....	64	64
Canada	.....	.....	49,388	49,388
China	.....	$165,225	3	165,228
Chili	.....	2	2,501	2,503
Colombia	$1,289	.....	120	1,409
Costa Rica	3,276	76	158	3,510
Dutch East Indies	.....	.....	25	25
Ecuador	240	.....	.....	240
French Oceanica	5,649	1,418	1,654	8,721
German Oceanica	23	.....	.....	23
Guatemala	153	14,510	3,613	18,276
Honduras	1,072	3,411	42	4,525
Hong Kong	.....	83,095	1,020	84,115
Japan	1,776	892,494	13 019	907,289
Mexico	17	6,635	25,828	32,480
Nicaragua	605	17,375	389	18,370
New Zealand	.....	.....	13,536	13,536
Other Br. Oceanica	.....	197	437	634
Panama	113	144	472	729
Philippines	.....	.....	3,238	3,238
Peru	40	.....	328	368
Salvador	2,222	5,466	1,111	8,799
Totals	$16,476	$1,190,048	$129,426	$1,335,950

Asphalt shipments: Argentine, $45; Australia, $345; Canada, $13,827; Chili, $664; Germany, $925; Guatemala, $590; Japan, $1,807; Mexico, $97; Straits Settlements, $142. Total, $20,956.51.

Hawaii and Alaska.

In 1910 there was an increase in the Hawaiian trade and the Alaskan shipments of fuel became of great importance since the Associated Oil Company's contract with the Treadwell mines. The fuel shipments were as follows, compiled in barrels of 42 gallons:

	Crude.	Residuum.	Total Fuel.	Total Values.
Alaska	397.000	1,016	398 016	$422,216
Hawaii	1,102,000	9,651	1,111,651	950,222
Totals	1,499,000	10,667	1,509,667	$1,372,438

Refined Oils.

Shipments of refined oils to Hawaii and Alaska in 1910 totaled 2,432,785 gallons, valued at $462,155—1,975,965 gallons, value $400,745, to Hawaii, and 456,820 gallons, value $61,410, to Alaska—to which should be added $3,992 worth of asphalt for Hawaii and $13 to Alaska and 200 gallons of naphtha valued at $43 for Tutuilla, Samoa, making a total value for petroleum and its manufactured products in 1910 of $2.300,796 shipped to American non-contiguous territory exclusive of the Philippines and the Panama canal zone.

The following is the table of refined products in gallons, in detail:

	HAWAII.		ALASKA.		TOTAL.	
	Qu'tity	Val's	Qu'tity	Val's	Qu'tity	Val's
Naphthas	555,150	$ 99,017	221,758	$ 36,490	776,908	$135,507
Illuminants	1,160,497	195,502	208,540	18,948	1,369,037	214,450
Lubricants	260,318	106,226	26,522	5,972	286,840	112,198
Totals	1,975,965	$400,745	456,820	$ 61,410	2,432,785	$462,155

FULLER'S EARTH.

An advance chapter from Mineral Resources of the United States, calendar year 1909, compiled by F. B. Van Horn and published by the Department of the Interior, United States Geological Survey, says:

The latest report on fuller's earth issued by the United States geological survey covered the calendar year 1907. Since that time no new work on the subject has been undertaken by this bureau. The edition of the report for 1907 has been exhausted, and it has been thought best to republish it with the addition of statistics for 1908 and 1909. This report is to be regarded as merely a compilation, and material derived from the books and papers of the authors indicated in the bibliography has been freely used as to both substance and wording.

The term "fuller's earth" is used to include a number of substances that possess strong absorbent properties. The material was originally used for cleasing cloth of grease and also for cleaning furs, but it is now mainly used in this country for clarifying oils.

Dana defines fuller's earth as including many kinds of "unctuous clays, gray to dark green in color, and being in part kaolin and in part the mineral smectite." It is placed by him with other claylike minerals (all of them hydrous silicates), namely, smectite and malthacite, of not very definite composition, but all containing a large percentage of combined water. It is inferred that Dana considers these minerals the cause of the bleaching power of fuller's earth.

Ries defines fuller's earth as a claylike substance that has the property of decolorizing or clarifying oils. He says:

"An ultimate chemical analysis shows it to differ from most ordinary clays in having usually a high percentage of combined water and a low amount of alumina. There is probably a large amount of hydrous silica present. Fuller's earth possesses little or no plasticity, and in order to work properly has to be ground very fine. A chemical analysis is of little value at present in determining its quality; only a practical test suffices."

Geikie defines fuller's earth as "a greenish or brownish, earthy, soft, somewhat unctuous substance, with a shining streak, which does not become plastic with water, but crumbles down into mud. It is a hydrous aluminous silicate with some magnesia, iron oxide, and soda." According to Geikie, fuller's earth owes its detergent properties to physical charactertistics rather than to chemical composition.

John T. Porter, in an article on the "Properties and tests of fuller's earth," presents a very interesting theory. He says that it is evident that Dana's theory will not stand, since the discovery of American deposits having a comparatively low percentage of combined water. Such earths could not possibly have as their base either smectite or malthacite, although they might contain very small quantities of these minerals.

Porter says that his analyses have confirmed Ries's statement that fuller's earth contains appreciable amounts of hydrous silica. However, it is evident that if the bleaching power of fuller's earth is due to this hydrous silica, treatment of the earth with boiling carbonate or hydrate of soda, which removes the silica, should destroy this bleaching power. He has tried this experiment on several earths, and although the results are not entirely concordant, yet there can be no doubt that fuller's earth retains at least a part of its efficiency after treatment by alkalies. It is also plain that carbonate of soda has a much less harmful action on the earth than the hydrate. As Fresenius and other authorities state that hydrous and amorphous silica are freely soluble in hot carbonate of soda, as well as in sodium hydrate, this difference can hardly be due to nonsolution of the silica by the carbonate, but is almost entirely due to partial decomposition of the earth by sodium hydrate. In this connection he noticed that sodium hydrate appears to extract considerable alumina as well as silica, but the carbonate does not. Fuller's earth after treatment with sodium hydrate is left in a very gelatinous condition and is extremely hard to filter and wash. For this reason it is possible that some of the samples treated retained considerable amounts of soluble salts after washing, although great pains were taken to remove them, and this may have had some influence on the results.

Another fact which might be used as an argument against this theory is that hydrous silica artificially prepared has but very slight bleaching powers. These results are naturally not conclusive, as the silicic acid occurring naturally may differ either physically or chemically, or both, from the artificial product.

One the other hand, some earths still retain a

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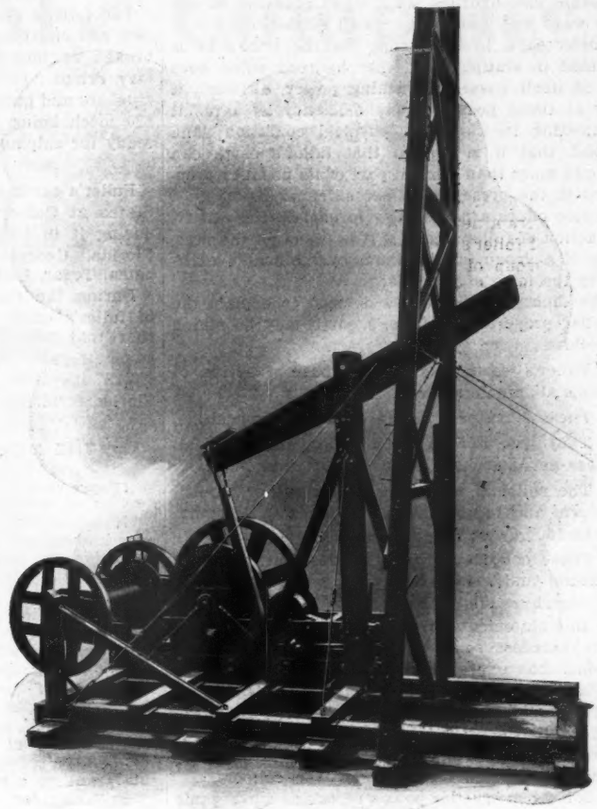

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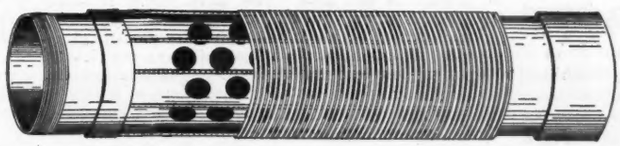

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considerable portion of their bleaching power after decomposition by acids, consisting then of 80 per cent or more of silica; and from this it seems probable that hydrous silica when prepared in certain ways may have some small efficiency.

Porter says, in conclusion, that he thinks he is justified in stating, first, that hydrous silica does not of itself possess bleaching power, although it may at times possess some efficiency as a result of existing in a certain physical condition; and second, that it is certain that fuller's earth can not owe more than a small part of its peculiar properties to the presence of free silicic acid.

Porter offers a new theory to explain the clarifying action of fuller's earth. It is based on the presence of a group of aluminum hydrosilicates existing in the form of pectoids.

The theory which he has devised to explain the peculiar properties of fuller's earth may be stated as follows:

1. Fuller's earth has for its base a series of hydrous aluminum silicates.

2. These silicates differ in chemical composition.

3. They are, however, similar in that they all possess an amorphous colloidal structure.

4. The colloidal structure is of a rather persistent form and is not lost on drying at a temperature of 130° C., or possibly higher.

5. These colloidal silicates possess the power of absorbing and retaining organic coloring matter, thus bleaching oils and fats.

In this statement Porter used the word colloidal in its broadest sense—to cover the whole range of conditions expressed by the words colloid, pectoid, and hydrogel. It is his opinion that the word pectoid would most properly express the condition of the active constituents of fuller's earth, but it is not impossible that these may go into partial solution in oil and thus become true colloids.

Colloids possess the power of taking up organic colors from solution and the analogy with fuller's earth is so apparent as to excite surprise that it has not been studied with this idea in mind before. It has even been known that pectoids could extract colors from oils and resins as well as aqueous solutions. Porter regards this as a strong point in favor of the colloidal theory, although by itself it does not, of course, constitute proof.

The power of colloids to absorb certain salts, or at least the basic ions of these salts, has been known a long time. This power is also possessed to a degree by certain amorphous substances having a fine porous structure, such as charcoal and boneblack. Fuller's earth has this property to a marked degree. In fact, its use has been proposed to remove the lime from boiler water. Porter has found that after it has absorbed ammonia or salts it loses a great part of its efficiency in bleaching oils. From this he infers that it absorbs the bases in the manner in which it absorbs the coloring matter of oil, the bases occupying pores which otherwise would hold the color.

It has been pointed out that these absorbent materials have a selective action on the salts, absorbing the unlike ions and discarding the ions of like chemical nature. If colors in oil solution are absorbed in the same manner as salts in aqueous solution, analogy would lead to the supposition that fuller's earth would exert a selective action for certain classes of coloring matter and, moreover, that the earths themselves would differ in their selection of colors according as they are more or less acidic in composition. This is stated to be in accordance with the facts.

In the course of his oil tests Porter noticed that on the same sample of oil different materials give products varying greatly in shade, the main color in some tests being of a yellow and in others of a green tint. It is not likely that the oil contains several compounds of varying chemical nature, and that the earths or other materials used in bleaching extract them in ratios proportional to their own basicity or acidity? He has been unable to obtain any exact data on this point from his results, owing to the difficulty of following these slight changes in tint with the unaided eye. A tintometer would be needed if this line of investigation were to be followed out.

Mining and Preparation.

The fuller's earth in Florida is usually mined by pick and shovel and hauled to the mill, where it is broken up into small lumps and put through rotary driers. It is then taken by elevator to the crushers and ground and bolted into several grades, 120 mesh being the finest. The material is then ready for shipment.

Production.

Fuller's earth was first discovered in the United States at Quincy, Fla., in 1893. The States producing it in 1909, in order of importance, were: Florida, Georgia, Arkansas, Massachusetts, Alabama, Texas, California and Colorado.

During the year 1909 the marketed production of fuller's earth in the United States was 33,486 short tons, valued at $301,604. This was an increase from the year 1908 of 3,772 tons in quantity and of $23,237 in value. Of the entire production in 1909, Florida furnished 22,470 tons, or 67.1 per cent.

THE MEANING OF A FRANCHISE.

(Paper read by Arthur S. Huey at the annual convention of the H. M. Byllesby & Co., at Chicago.)

Napoleon, the greatest manager the world has ever known, once said: "To conduct public affairs, deep thought, profound analysis and the faculty of unwearied attention are necessary."

To many the possession of a public-utility franchise is only an opportunity for personal gain; to the conscientious man such possession means an opportunity of administering to the public welfare. A city in granting a franchise not only places in the hands of the grantee an asset of value, but makes the grantee a trustee of the public good. The term itself, public utilities, implies being useful and therefore of benefit to the public. To attain this end the service must be competent. Along with this grant go certain legal restrictions and rights.

Speaking for my corporation I say to you that our organization prefers to consider the spirit rather than the letter of the law, believing that if we administer our affairs as a public trust we will seldom if ever require defense of legal rights. We as managers and operators of electric, gas, street railway and telephone properties, prefer to hold our franchises by retaining the confidence of the people; to hold the privileges conferred by the public not by right of law but by right of merit. So thoroughly does our organization believe in this principle and so anxious are we for its genuine application in all the municipalities in which we operate utilities that I am now making a special effort to deeply impress upon you its far-reaching significance.

The phrase, "a public-utility franchise is a public trust," is not new. You have heard it many times. Exponents of radical thought, crusading against utility corporations, have frequently given it voice. It has been the slogan of many politicians. I wish to convey to you as clearly as possible the opinions and wishes of your employers in a matter which determines our commercial existence and your own as well. If you are able to realize that, without the sufferance and good will of the public you serve, your positions would be non-existent, it will be borne in upon you that your interests and those of your public are identical. I do not need to speak of the high appreciation we feel for your ability, your loyalty and your eagerness to serve our interests. It is hard in the light of this understanding and our intimate relations to offer criticism. Yet I feel the time has come for plain talk, and I ask you to give me your undivided attention. Do you understand that the public has rights that you are ethically as much bound to regard as you are to fulfill your obligations to your company? As managers, assistant managers, superintendents and heads of departments, your self-questioning should be searching.

Obviously we are a commercial institution. We are not organized for the propagation of religion or political doctrines or for the relief of those distressed. Equally obvious is it that I do not, addressing you as members of a commercial organization, advocate that which would be to our financial detriment. When I urge upon each one of you to look upon your franchise as a trusteeship to be administered in the interests, not only of your company but of the people, I view the matter from a business standpoint and speak as a business man. The interests of the people and of utility corporations are interwoven. The city needs the utility; the utility would be non-existent without the city. The prosperity of a city demands a wholesome growth; the opportunity for utility earnings likewise requires this growth. Good service and fair rates promote the welfare of the public. Use of the service offered determines the welfare of the company.

Every active utility organization is composed of two factors—plant and franchise. All utilities such as we operate must have access to and easement over streets and alleys. The streets and alleys belong to the public. The public properly has the right to say how and for what purpose thoroughfares shall be used. The public, you will perceive, contributes one of the two essentials to an operating utility, namely, the franchise. The company provides the plant. It follows that the company and the public are partners in the enterprise. On the one hand we who invest the capital, the time and the energy expect compensation measured in dollars and cents. On the other hand the public expects good and adequate service at fair rates. It has just as much right to expect these things as we have to anticipate proper financial reward.

In the operation and extension of our properties there is rendered distinct and important social value. By the mere act of placing transportation, electric, gas or telephone service at the command of the citizens, we increase the financial worth of every business undertaking and every piece of property. No municipality in this country can succeed today in competition with other municipalities without these necessities. They are indispensable to municipal life. As all dwellers in a city contribute to its social value, so do all business undertakings and commercial endeavors. It is doubtful if any other commercial institution does as much or nearly as much as the utility. In other words, so long as a privately-owned public service organization is conducted in a progressive manner, it returns dividends of substantial character to that part of the equity-holders represented by the public, and these dividends accrue from the moment the plant is placed under construction.

Liberal financial return to those who risk their money in the undertaking should not be denied, and I believe will not be denied. The operation of a utility is a retail business. You serve large numbers of people and you carry an account for each customer. You come into commercial contact with most of the people of your city not occasionally, but once a month and every month in the year. All customers can not be entirely pleased all the time. There are other citizens besides your customers to be taken into consideration. There are always a few individuals with ulterior motives. The business has its own chain of inherent difficulties. You can not anticipate a continual path of roses. But, if you start with the principle I have given you—that you hold a public trust—you will find it of inestimable benefit in making a success of your work. You will find your labors lightened and your projects stimulated in a manner that will astonish you.

It may be worth while to list specifically what we believe to be the principal obligations of both parties to a franchise:

1. Rendering of good, adequate and continuous service.
2. Fair and reasonable rate schedules.
3. No discrimination among customers of the same class, or between classes of customers for like service.
4. Extension of service into all populated sections of the municipality and suburbs.
5. Earnest endeavor to market the greatest possible volume of service.
6. Adoption of approved inventions and developments in machinery and apparatus.
7. Sound financial management.
8. A high standard of physical maintenance.
9. Public spirited attitude in all matters concerning the general welfare and advancement of the community.
10. Broad and liberal business administration.
11. Keeping faith with the people in all agreements, promises and announcements.
12. Strict obedience to law and no participation in politics.

So much for our duties and responsibilities as we comprehend them. Granted that the utility corporation lives up to this code, what is due from the public?

1. The same degree of confidence, encouragement and respect that one business man accords to another or that any citizen expects from his neighbor.

2. Willingness to permit a fair profit on the capital, energy, ability and risks embodied in the undertaking, to permit a profit greater than mere interest which could be obtained without effort or hazard.

3. Disregard of attacks by popularity-seeking agitators.

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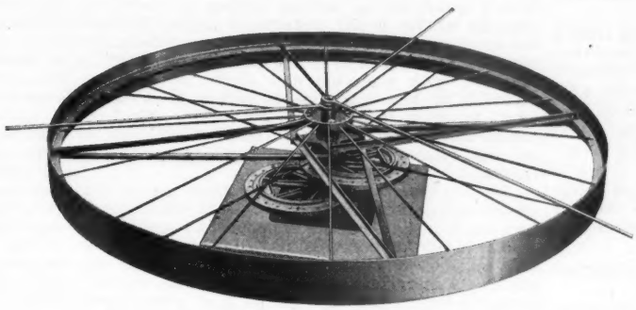

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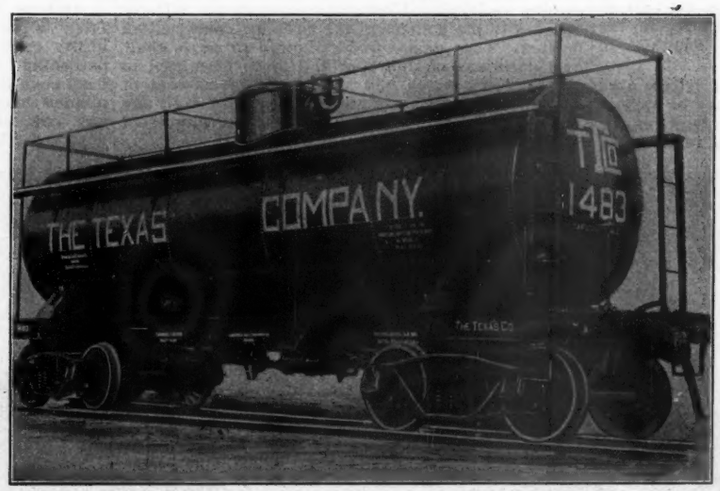

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4. Willingness to recognize and reward improvements in service.

5. Recognition of the fact that the operation of utilities differs fundamentally from merchandising or manufacturing.

6. Reasonableness in demanding large capital outlays for improvements not strictly necessary to the rendering of adequate service, such as placing wires underground in cities of small and medium size.

7. To make prompt payment of bills, because the company can not render the service demanded if its only source of income is retarded.

8. Protection against direct competition. All authorities agree that public utilities can be conducted with greatest benefit to the public as controlled monopolies.

9. Careful consideration of legislation—municipal, state and national, which would hamper and curtail the development of utilities.

10. Recognition of the fact that, starting from a given base line, which varies in different localities, reduction in rates can be secured without financial loss only by increasing the volume of service sold.

11. Recognition of the fact that no utility company can well serve a municipality if it is not in prosperous condition and able to secure the investment of new capital on favorable terms.

12. Treatment of all questions affecting public utilities in a fair-minded way, looking upon them as business questions without regard to political considerations.

Let us now consider the various obligations enumerated:

As public utility men you require no elucidation of the first eight sections of the code applying to utility operation. These rules of corporate conduct, with the remaining four, constitute our operating policy. We have always sought to make each property in all respects part of the local, commercial and social fabric of the community in which it is situated. Never to my knowledge have our companies been found wanting in quick and generous personal and financial support of all public measures designed for the good of the entire municipality. Many of our managers have participated actively in the work of business men's associations and other bodies of like character.

In few lines of endeavor do petty practices cost so dearly as they do in the operation of public utilities. It is suicidal to adopt a policy bounded by the straight-laced terms of contract and franchise, cap-sheafed by the motto, "We don't have to." The "we-don't-have-to" spirit has caused unmeasured and well-deserved woe to public-utility corporations. It was one of the mortal sins of the old-time operator and we of the present day are still doing penance for its commission.

If a man from the outskirts of your city comes into the office and asks that the electric lines or the gas mains be extended to serve him, you should not dismiss him with a curt reply. You should explain how a company's first duty is to keep itself solvent and that doing as he wishes without first altering conditions so as to protect the company against loss, would be a breach of trust not only to your stockholders but to a great majority of the local public. Then try, you and he together, to work out a plan satisfactory to both.

While on this phase of the question, let me urge you to fight as a pestilence any tendency or appearance of a tendency to "slip things over" on the municipality. This kind of work is a relic of the stone-age in public utilities. Transact your business above board. Frame your policy and your projects honestly and "stand pat." Thereby you will increase respect for your occupation in the minds of your fellow men.

With reference to keeping faith with the people, I have this to say: A corporation under the management of H. M. Byllesby & Co. has never to my knowledge broken a definite promise to a community, whether the promise was in the form of a legal contract or not. We are careful to be sure of our ground before we make our announcements, and what we promise we fulfill.

Now, gentlemen, if you will continually bear in mind that you are not only the managers of privately-owned properties, but the trustees of public rights, you will instinctively follow the lines I have indicated. Carrying out this idea, you will find that your administration will cause the public to treat you fairly, to be as liberal with you as you are with it and it will be entirely willing for your company to receive a full measure of profit. We can not be expected to achieve a liberal and satisfactory administration if every act of the company is regarded with suspicion and every move in the interests of better service is looked upon as an effort to extort money from the public. Whatever reason may have existed in the past for such an attitude, exists no longer in companies progressively managed.

We are entitled to protection from poorly considered legislation. Often laws calculated as reforms turn out to be burdensome to people and corporation alike. In certain communities a tendency exists to levy taxes of inequitable severity upon utility companies. Excessive taxation of this kind logically promotes higher rates for service than would otherwise be necessary, because the company must obtain additional funds to meet the imposts and can do so only through its single source of revenue. The result is a step toward unequal taxation, for a part of the tax-burden is inevitably shifted from the property-owner to the user of utility service. The company is unable to reduce rates or extend service to new and thinly settled districts.

The topic of legislation leads naturally to the conservation movement affecting water-powers and water-power sites. I think you will agree that no private corporation or group of corporations should be greater or more powerful than the government. It would be exceedingly disastrous to all private corporations should this condition ever exist. There is no question but that the public domain and its water-powers, timber and minerals belong to the people. There is a question, however, as to just which people they belong to. Does the public domain remaining in the state of Washington, for example, belong to the people of Washington, or in part to the people of New York and all the other states? New York and the other well-settled states had their public domains and profited thereby. Did any of the pioneers of the northwest share in these profits? Wherein lies the right of the older-settled states to participate in the natural resources of the new lands, as opposed to the rights of the men and women who are populating these undeveloped sections?

You will find that the people of the states which contain undeveloped natural resources are bitterly opposed to the policies of the so-called conservation leaders. They desire to be allowed to settle their own questions of this kind and to be permitted to devise terms which will attract the investment of capital, guaranteeing to protect the rights of all and will promote the material welfare of the interested commonwealths.

In developing water-powers in new territories capital assumes substantial and well-recognized hazards. It is hard to get money to build dams and equip power-houses and transmission lines when population and industry exist mainly on paper and in the hopes of the pioneers. Because people and industry are necessary to civilization and the creation of wealth the newer states offer water-power rights on favorable terms. They realize full well that a city filled with factories made possible by cheap power and filled with people supported by those factories, is a far more cheerful and attractive objective point to desirable citizens of every station than a water-power site held sequestered while conservation congresses meet and the reputations of statesmen are builded. The cry that if a private corporation develops and owns a water-power the people whom it serves will be forever at its mercy as to rates and terms of service, is one of the most unjustified calamity-howls ever uttered to delude the public. Who can note the trend of recent court decisions and doubt that the rates for service of every public utility of any description are subject to regulation by the people? We who are vitally interested recognize these facts and shape our course accordingly.

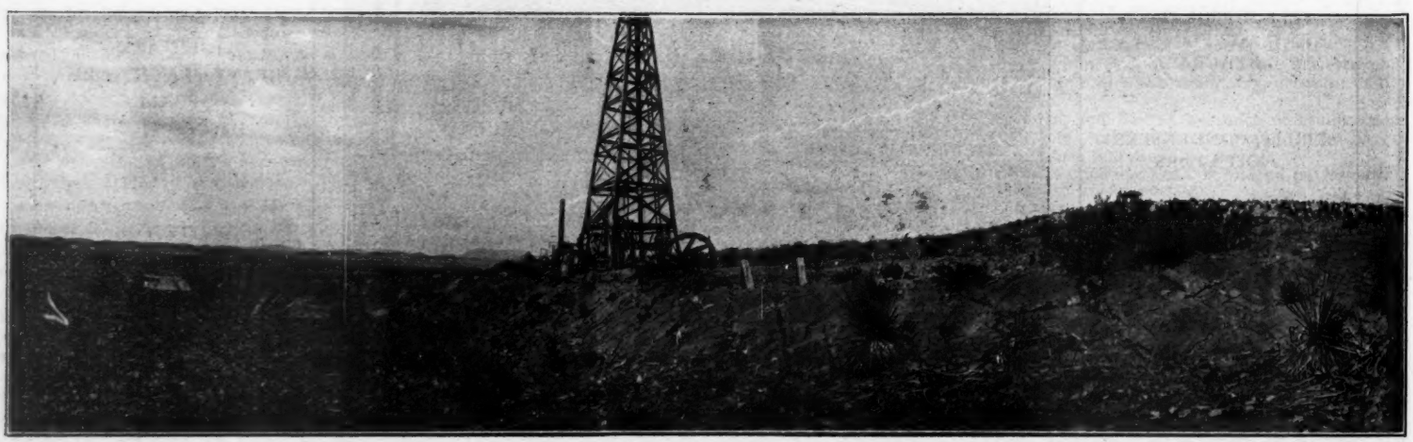
I am glad to say that there is abundant evidence that the public and those whom it has elected to represent it in high places, are growing more fair-minded in their ideas of what constitutes a reasonable profit in a utility undertaking. The injustice of reducing this profit to interest rates and fixing a dead line beyond which earnings must not go, and at the same time expecting investment of capital, improvement and extensions of the service and the employment of enterprises and initiative, is being clearly recognized by those who study the question.

This point I can emphasize by quoting from a recent address of Edward M. Bassett, a member of the public service commission of the state of New York for the first district. Mr. Bassett said:

"Efficiency in a public utility corporation redounds not only to the benefit of the public, but should redound to the benefit of the corporation itself. That saving which comes from thrift—that greater earning capacity which comes from ingenuity and faithfulness—is properly divided between the public and the corporation itself, not forgetting the payment of good wages and the making of permanent and prominent positions for those that contribute to that result. I for one am of the opinion that public regulation should incite and increase and encourage private initiative. Thrift, economy, better results for a certain amount of work, more electricity from a certain number of pounds of coal—that efficiency should not be entirely, or anywhere near entirely, taken advantage of by the public. The corporation that can produce results is entitled to a large measure of the benefits of its own efficiency and progress."

The more enlightened view regarding the regulation and treatment of utility companies was given a partial expression in the recent annual message of Governor Charles S. Deneen of Illinois, who advocates regulation by a state commission empowered to collect accurate data, require adequate service and, to quote his exact words: "To fix rates which will be fair to the public, will assure to investors a reasonable return upon their investment, and will offer inducements for the investment of private capital in public service corporations to stimulate their growth as the public needs may require."

One of the most difficult questions to decide fairly is the extent of profit which is reasonable in utility undertakings. There is no doubt that the percentage varies geographically and is affected by local conditions. We believe that a serious and fair-minded consideration of the question will convince any commission that a liberal compensation is deserved. With reference to direct competition in



A TEXAS WILDCAT WELL.

The Standard Oil Company's Libel Suits

In the matter of libel suits brought by the Standard Oil Company for $250,000 damages against *Hampton's Magazine* and for $100,000 damages against Cleveland Moffett, the former the publisher, and the latter the writer, of an article in the February issue of the magazine, which defamed the company in connection with the sale of poisonous candy in Philadelphia, the following retractions have been signed in the office of Shearman & Sterling the Standard Oil Company's lawyers in the case:

HAMPTON'S MAGAZINE
66 WEST 35TH ST.
NEW YORK

January 31, 1911.

Standard Oil Company, 26 Broadway, New York.

Dear Sirs:—In the February issue of *Hampton's Magazine,* there was published an article, written by me, entitled, "Cassidy and the Food Poisoners." In that article I referred to the investigation of Mr. Cassidy, with respect to the manufacture and sale of impure candies in Philadelphia, and made the statement that your Company manufactured and sold impure material which went into these candies and that, when the various dealers were arrested and fined, at the instance of Mr. Cassidy, your Company paid the fines.

Upon investigation, I have ascertained that your Company was in no way connected with the transactions referred to and I hasten to retract in the fullest manner all charges made against your Company and to express my sincere regret that I should have fallen into this serious error.

Yours truly,
CLEVELAND MOFFETT.

January 31, 1911.

Standard Oil Company, New York City.

Dear Sirs:—Referring to the foregoing letter of Mr. Cleveland Moffett to you, we beg to state that we are convinced that Mr. Moffett was in error in his statements with reference to your Company. We greatly regret that this error should have been made. It is the desire of *Hampton's Magazine* to be accurate and fair in all things. In our March number we will publish this letter and the foregoing letter of Mr. Moffett.

Yours truly,
BENJ. B. HAMPTON,
President, *Broadway Magazine,* Inc.

utilities it is unnecessary to say much at this time. All authorities and all genuine students of utility problems agree that municipal utilities can be operated most economically and most satisfactorily in the interests of the people as monopolies. We should never disregard an opportunity to explain to the public the truth of this principle and to support it by readily understood facts. If a management is progressive and conducts the business as a public trust, the terms of its franchise matter little. On the other hand, if the management refuses to recognize the equity of the public and declines to be liberal and fair, that management will go down to merited defeat and financial loss, regardless of the most liberal franchises ever granted.

ILLINOIS HISTORICAL REVIEW.

The state geological survey of Illinos, of which Frank W. Dewolf is acting director, has just issued a very comprehensive report on the oil resources of that state, with special reference to the area outside of the southeastern fields. The review was compiled by Raymond S. Blatchley. In a general historical review of the Illinois development the following information is set forth:

In the main oil fields of Illinois, exclusive of producing areas elsewhere, there have been drilled, during the past five years, over 16,000 wells in a producing territory which covers about 240 square miles. The following notes sketch the history of drilling from the earliest days.

In the earlier part of the sixties, the first oil excitement spread over the eastern United States and extended westward to Illinois. In 1865 the first wild-catting took place in Clark county about 8 miles north of Casey, in Parker township. Here, several holes were put down in attempts to locate oil and gas but the work was abandoned. The small amount of oil found in the wells perhaps would have been greater had proper casing been used. This would have shut off the salt water, which, as a matter of fact, probably drowned out the oil and prevented an earlier discovery of the present immense field.

About this time, oil and gas were found accidentally in Montgomery county, near Litchfield. Coal prospecting from the floor of one of the mines led to deeper drilling and the discovery of a strong flow of salt water which threatened for a time to flood the mine. Another coal prospect near the mine discovered a small quantity of oil and gas. The oil and water from this drill hole leaked into a sump in the mine, where for many years oil was skimmed from the top of the water and utilized.

During the eighties, when new prospecting was taking place at various points in Illinois, the previous finding of oil at Litchfield led to renewed drilling which brought in several gas wells in that vicinity. In 1882 a well was found about 2 miles south of Litchfield, which was reported to produce about 400 pounds gas pressure. This well was apparently first drilled to 580 feet without success. Two years later it was drilled 200 feet deeper, where water bearing sand was tapped. The gas was secured at 640 feet and had exceptional pressure. The flow of salt water, however, was too strong to be plugged successfully and, consequently, drowned out the gas. In 1886 a number of wells that yielded both gas and oil were drilled in the vicinity of Litchfield, to an average depth of about 650 feet. In all, between the years of 1862 and 1889, about thirty wells were drilled. The majority of them were of short life but five or six produced a small amount of oil up to the year 1903. All are abandoned at the present time.

Gas was discovered in Pike county in 1886 while drilling for water in section 1, Derry township. It was found at a depth of 186 feet. This destroyed chances of a good water supply so a second well was drilled on the same farm a short while afterwards. Gas was secured in this well at the lesser depth of 168 feet. Both wells were abandoned because of lack of facilities for taking care of the gas. Drilling was then suspended in this part of the state for 15 years, or until 1905. In that year William Irick drilled a well for water on his farm and, as in the previous cases, met a strong flow of gas. He, however, piped it to his house for domestic use. There immediately followed a development of this area, which, in a little over a year, brought in over thirty wells. All but six of these produced gas, but no oil was found. The gas horizons are between 75 and 350 feet below the surface. The field at the present time covers an area about 10 miles long and 4 miles wide. The gas accumulation is governed by a small fold in the Niagara limestone.

Similar prospecting took place in 1888 near Sparta in Randolph county. Home capital was enlisted and a well that yielded a good pressure of gas was drilled to a depth of 850 feet. This encouraged further drilling and up to the year 1894, 22 wells were put down. Of these, over twelve yielded gas, and four of them had initial pressures between 150 and 250 pounds to the square inch. The average life of the wells was about seven years.

The next recorded wild-catting took place in 1900 and indirectly resulted in the discovery of the main oil field. A company styled the Crawford County Oil, Gas and Coal Company drilled a well in section 35, Robinson township, Crawford county. The well reached a depth of 820 feet where it was abandoned because of the caving of the strata and the tapping of a strong vein of salt water. The same company shifted operations in the following year, 1901, to the D. C. Jones farm in the southwest quarter of section 22, of the same township. A well drilled here to a depth of 1,040 feet secured a small amount of gas. Thus, the efforts of the company to locate fuel were rewarded slightly and with further hope, they drilled to 1,190 feet. At this point they met a strong vein of salt water and abandoned the well. The company attempted other wells on the same farm in the years 1901, 1902 and 1903, but, in each case, lost their tools. The sixth attempt was rewarded, in 1904, by the finding of small amounts of oil and gas between 900 and 1,200 feet. The hole was drilled to 1,330 feet but was abandoned. It was but eighteen months after this that the main productive field was opened up within a few miles of this area.

The sugestion of an oil field in the vicinity of Casey prompted by the earlier prospecting of the sixties, led Col. L. D. Carter, of Oakland, Illinois, to secure the services of J. J. Hoblitzell & Son, of Pittsburgh, Pa., in re-drilling this area. A large block of leases was gathered up and early in the spring of 1904 a well was started on the Young farm near Oilfield. This well produced a good pressure of gas and some oil. The gas was cased off and used for field operations but the oil yield was insignificant and was discarded. A second well was completed in the same year on the J. S. Phillips farm in the northeast quarter of section 18, Parker township. It produced 35 barrels of oil. Other wells were started in the same year in this vicinity and in 1905 about 100 square miles of territory was being drilled. Of this about 60 square miles were eventually found productive. These fields are called the shallow area because the oil comes from a depth of between 400 and 600 feet. Drilling was active until 1909, when the boundaries of the productive territory for this section of the oil fields was pretty well established. In 1909 there was a decreasing development and at the present time it has practically ceased. A great many of the original wells are yielding so poorly that they are rapidly being plugged and abandoned.

Added vigor was given to the development of the Eastern Illinois fields in 1906, when D. T. Finley, of Pittsburg, drilled a well on the J. W. Shire farm in the northwest quarter of section 15, Oblong township, Crawford county. The oil was obtained at 890 feet, and the initial production was 250 barrels per day. This well opened up the Robinson pool, which is the largest in the oil area and covers, in all, about 110 square miles of productive territory. The oil is found in sands ranging from 750 to 925 feet in depth. There is one general sand made up of three distinct and generally parallel lenses. There are, however, small areas where only two lenses are noted.

The year 1907 brought an extension of development in a small isolated pool about three miles to the southeast of the large Robinson pool. The new pool was known first as the Honey Creek district and originally covered but six or seven square miles. It has later been associated with the Flat Rock district to the east and the two are practically joined, so as to comprise about 25 square miles of area. To the north of the Flat Rock area the small Duncanville pool was developed. The area covered is between two and three square miles. The oil is from about the same horizon as that of the Honey Creek, Flat Rock, and Robinson sands but has a much lower gravity. It is used almost exclusively for fuel.

The Lawrence county field began to be developed actively in 1907-1908. It has been the most promising, in that seven sands are attracting the attention of operators. The sands occur between depths of 800 and 1,950 feet and are known as follows: Bridgeport, upper lens, middle lens and lower lens; Buchanan, Kirkwood, Tracy and McClosky.

Within this area, which covers about 40 square miles, there has been developed a larger per cent of big wells than in all of the other pools combined.

After the Clark county field was brought in miscellaneous drilling was stimulated throughout the state as indicated by the following notes:

A second attempt was made to discover oil in the vicinity of Sparta. J. J. Hoblitzell & Son began drilling there in 1906, and as a result two or three wells that produced oil in a small quantity were completed in the following year. In 1908 a total of sixteen wells had been drilled but of these only six or seven yielded oil. The amounts were small, except in the case of two wells, one on the Foster farm that yielded about twenty barrels of oil per day, and one on the McIlroy farm that had an initial production of about 100 barrels. All the wells have since declined until the field is all but abandoned.

In 1906 an attempt was made to locate oil at Tolono in Champaign county. The drilling revealed oil, but only in slight quantity. Apparently it was the intention to strike the La Salle anticline which gives rise to the productive area to the southwest. As mentioned elsewhere, this fold probably occurs a few miles to the west of Tolono.

Early in the year 1908, oil was reported to be seeping through a fault into a coal mine near Centralia, Marion county. The attention of oil operators was attracted and several shallow wells were drilled. These yielded small amounts of oil and were of slight commercial value. Wild-catting was prompted in the winter of 1909 in the vicinity of Sandoval, five miles north of the Centralia shallow wells. Late in March, a deep well which yielded about thirty barrels per day was completed upon the Stein farm, one mile north of Sandoval. A second well was finished in July on the Benoist farm, adjoining the Stein land. This well proved to be a valuable producer of both oil and gas. Its success stimulated wholesale leasing in all directions in Marion county. Several wells were soon drilled but the majority of them were dry. The producing area, so far as indicated by subsequent drilling, lies in a north and south direction.

A new gas area was opened in 1909 near Carlinville, Macoupin county, by Thomas Rinaker, who drilled five wells south of that town. The gas comes from a sandstone that is devoid of oil and water.

Various other attempts have been made to find oil at widely separated points. Small amounts of oil or gas have been observed in such localities as Mascoutah, Marissa, Waverly, Greenville, Decatur, Iola and Eldorado. Barren wells have been put down at Herrick, Cobden, the American Bottoms east of St. Louis, Trenton, Aviston, Iuka, Olney, Sumner, Albion, Patton, Carmi, Duquoin, Pinckneyville, Coulterville, Vandalia, Marshall, Thomasboro, Grafton, Jerseyville, Kane and at a number of other places. Little attention is paid in this report to the presence of gas at such points as Champaign, Princeton, Colchester, Wapella and other points, where it comes from shallow depths in the Pleistocene or drift deposits.

The minor lease bill that Representatives Gillespie and Jeffords introduced in the Oklahoma legislature has passed without the validating clause and providing for advertising. Some people prefer to secure leases without advertised publicity, while some like the publicity feature—a personal whim, perhaps. Leases over which a cloud lies because one was advertised and another was not are safe if they are right, and if not right perhaps should not be safe. The fact that a lease law of any sort will be on the statute books is a great deal better than no law at all.

The commonwealth of Australia has served notice to the entire world, except Australia, that no trust, or any man or combination of men that look as if they might be on friendly terms with any one who has a trust concealed about his person, will be permitted to make even board money in that domain. The thing that stirred up the virtuous bile of these Australian monopolists was the anticipated approach of the American packing-house people with a porterhouse steak that looked so good there was a scramble for it. Considering this announcement deliberately and with an open mind, we believe that President Taft should modify his reciprocity policy sufficiently to bar forever every male person of Australian citizenship who bears the ear-marks of a desire to break into the American prize-ring and swindle us out of our money. The exportation of bum fighters, so far as we have studied the consular reports, is Australia's chief industry.

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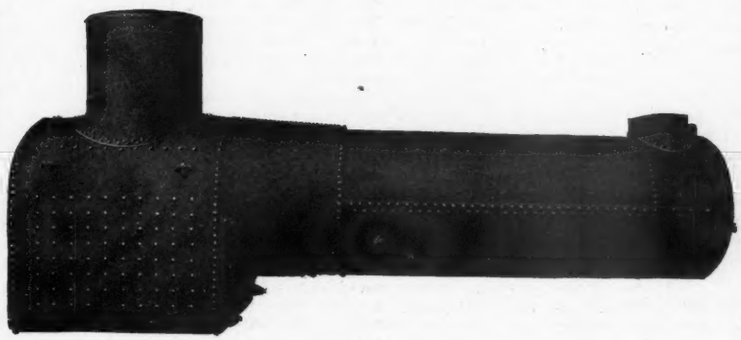

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TRADE NOTES

The Standard Oil Company of New York has contracted to furnish 30,000 gallons of road oil, for use on macadam roads near Albany, N. Y., at a bid of .0435 cents per gallon, spring delivery. The Indian Refining Company, of Cincinnati, bid .0450 cents per gallon.

The directors of the Indian Refining Company, of Cincinnati, have decided to issue $5,000,000 worth of 6% first mortgage gold bonds, to cover short time notes issued during the past two years and to redeem debentures of the Bridgeton Oil Company, a subsidiary.

It is stated on high authority that when the plans for the two big dreadnaughts to be authorized by the present congress are finally submitted for approval, they will contain a recommendation that their motive-power be derived from fuel-oil exclusively.

Mayor Morgan Minamyer, of Ashland, O., and about a dozen other citizens have just organized the Ashland Oil and Gas Company, with a capitalization of $10,000, and propose to drill a test well at once. The company has leases on about 1,500 acres in Putnam county, near Ottawa.

Japan's importations of petroleum from the United States more than doubled for 1910—15,963,655 gallons—over the importations for 1909—16,145,408 gallons. During the same period the purchases from Sumatra and Borneo were approximately the same, 7,813,522 gallons.

Advices received in New York City note that the Wyopo Pipe Line Company, with a capital stock of $10,000,000, has filed articles of incorporation and will immediately build pipe lines to carry oil from the Central Wyoming fields to the railroads and ultimately to Omaha and Denver.

F. C. Henderson, president and manager of the Superior Oil and Gas Company, Nowata and Alluwe, Okla., with about 1,100 acres of leases and between 100 and 200 producing wells, is installing a gasoline plant to utilize casing-head gas. He will buy a compressor and put in the plant himself, after making an investigation.

During 1910 the San Antonio and Aransas Pass railroad ("Sap") consumed in its locomotives 550,000 barrels of fuel oil, mostly crude. The "Sap" road is a part of the Southern Pacific system in Texas, running from Waco to San Antonio and Aransas Pass, from San Antonio to Corpus Christi and from San Antonio to Houston and from San Antonio to Kerrville, with tap lines.

The Creek Refining Company at Okmulgee, Okla., is contracting its naphthas to one of the big refining companies and its residuum to the Frisco railroad, on whose line the plant is located. Fifty per cent of the output goes as fuel. The company is likely to be put on a better financial basis that will permit an increase in its output.

At the annual meeting of the Pure Oil Company, held in Philadelphia last week, Judge S. S. Mehard, of Pittsburg, was elected to succeed C. P. Collins, one of the board of trustees. J. B. Akin, L. Walz, D. E. Byles and E. H. Jennings were elected to succeed themselves. No other business of importance was up for consideration. The refunding proposition will not come up till the June meeting of the directors and stockholders.

In the deep sand territory of southeastern Ohio a number of producing properties have recently changed hands. The latest deal reported transfers the property of the Kenyon Oil and Gas Company to Fitzgibbons & Kennedy. There are five wells, with a 50-barrel production, and the price is said to have been $51,000. In the Bremen field, the Great Expectation Oil Company sold its Kellenberger town lot well to C. T. Griffith, of Shawnee, O., for $6,000.

That oil fuel is gradually winning its way with naval officials is daily becoming more apparent. Maxine Labeuf, a prominent French naval constructor, has sailed for New York to submit to the United States government a type of submarine boat which will utilize heavy oil for internal combustion engines. Charles R. Flint will represent M. Labeuf in America. The Creusot firm is building a number of Labeuf boats for various European governments.

The Union Oil Building Company, a $1,000,000 organization, has just been incorporated, at Los Angeles, Cal., by Lyman Stewart, Robert Watchorn, Edwin T. Earl and E. R. W. Frost, for the purpose of erecting a modern, fireproof 11-story-and-basement office building, to be known as the Union Oil building. It will have a frontage of 100 feet on Spring street, by 155 feet on Seventh, and is to be ready for occupancy soon after January 1, 1912. The Union Oil Company and its subsidiary companies will occupy several of the office floors and several other oil concerns are figuring on space.

A slight improvement in the market for line pipe is noted and several large projects for oil and gas lines, covering sizable tonnages, are under consideration. The Tri-State Natural Gas Company has placed a contract for about 75 miles of 3 to 10 inch pipe, but the name of the mill which booked the order is being withheld. Discounts are being more firmly maintained. In iron pipe sales throughout the central west, a marked increase is shown, and in some instances manufacturers have advanced quotations one dollar on gas pipe.

Representative B. D. Harshberger, of the Utah legislature, has introduced a bill amending the existing State law in reference to fluid standards. Under the provisions of the bill the standard for fluids manufactured from petroleum for illuminating purposes is raised from a fire-test of 110° to 120° Fahrenheit before they shall emit any flash or inflammable vapor. Further, it is provided that gasoline must not be of less gravity than 60° Beaume; benzine or naphtha not less than 60°, and distillate not less than 52° Beaume. If the bill passes it will be the duty of the State dairy and food commissioner to enforce its provisions.

The Pure Oil Company has declared a quarterly dividend of 1¼ per cent on its common stock payable March 1 to holders of record February 1. Stock transfer books were closed during the month of February. The company, previous to December 1, had been paying 2 per cent quarterly on this stock or 8 per cent a year. On December 1, 1910, a dividend of 1¼ per cent was declared. A letter from the treasurer to stockholders explained that the reduction was due to the fact that $400,000 of the preferred stock would expire during 1911, and as this obligation must be met, it was considered advisable to reduce the dividend.

The Nevada Consolidated Copper Company, after some preliminary experimenting, has just equipped its Steptoe reverberating furnace with oil burners. The remaining five furnaces will be equipped as soon as practicable—each furnace consuming from 200 to 300 barrels, or about six tank-car loads per day. In addition to a large saving in fuel costs, the company expects the added advantage of an easily regulated heat and one which can be distributed uniformly. A large concrete reservoir has been constructed on the hillside above the smelters, and the oil flows by gravity through a system of feed pipes to the fire-boxes.

The Neodesha, Kas., and Sugar Creek, Mo., plants of the Standard Oil Company are delivering 27,000 barrels of fuel oil a day and could contract for a great deal more if the plants could turn it out. These deliveries are not confined to any class of consumers, but go to almost every industry that uses fuel, including at least three railroads, zinc and lead smelters, power plants and heating furnaces. Large quantities of road oil are also disposed of. All of the company's Eastern plants fill all fuel orders with residuum. There is still some argument as to the relative merits of residuum and pure crude for fuel in some localities, but residuum has established its position beyond question. Government fuel experts insist that for vessels and other efficient service the residuum gives the greatest satisfaction, because of the removal of all impurities, permitting uninterrupted and complete utilization of every atom of the fluid.

Advices from Baltimore state that the directors of the Houston Oil Company have arranged a refinancing plan, which is to be formally approved at an early meeting of the board. It is understood that William Saloman & Co., of New York, will head a syndicate to underwrite an issue of 5% bonds, secured by the oil company's entire property; the issue to cover the present indebtedness under the Kirby Lumber Company certificates, which is $5,865,000, with enough additional to pay the expenses of the new financing. The bonds will run until 1925 and will carry sinking-fund provisions. It is said also that a part of the proposed plan is the issuance of approximately $13,000,000 of new 5% cumulative preferred stock, to be given in exchange for the present $8,784,000 6% cumulative stock, and also to pay accumulated dividends on the old preferred shares, which on January 1 last, amounted to about $4,216,416. It is not proposed to disturb the present common stock. The remaining Kirby Lumber Company certificates are a first lien under a decree of the United States circuit court for Texas, on yellow pine timber owned by the company, which is conservatively estimated to be worth $22,500,000. In addition to this, the company owns free of encumbrances, virgin hardwood timber valued at $4,000,000, and 900,000 acres of land said to be worth on the average $10 an acre.

PERSONAL MENTION

Col. Robert C. McKinney, president of the Niles-Bement-Pond Company, of New York, has sailed for Egypt on a pleasure trip to be absent four months.

George Eyssen, general credit man for the National Supply Company, Toledo, O., is holding his own as to avoirdupois and geniality, as noted during a visit to St. Louis during the week.

Captain Taggart, of Marietta, O., is spending the winter with his son "Jack," at Tulsa, Okla. Captain Taggart followed the old eastern oil fields from their discovery and is pumping some old wells that make only seven gallons, but adding their mite to make him a prosperous producer.

J. W. Young writes from Bartlesville, Okla., where he is general manager for the Barnsdall Oil Company, to express his appreciation, as a Republican, of the qualities of Grover Cleveland as a great statesman representing the Democratic party and to contribute $50 to the fund being raised to prepare a commemoration.

Ben Gessell, who recently returned from Mexico, where he served as division field superintendent for the Pearsons for a year and a half, is now a contractor and is living at Cleveland, Okla., where he has tools running in the Osage and Pawnee counties. Ben was also Osage superintendent for the Barnsdall Oil Company several years.

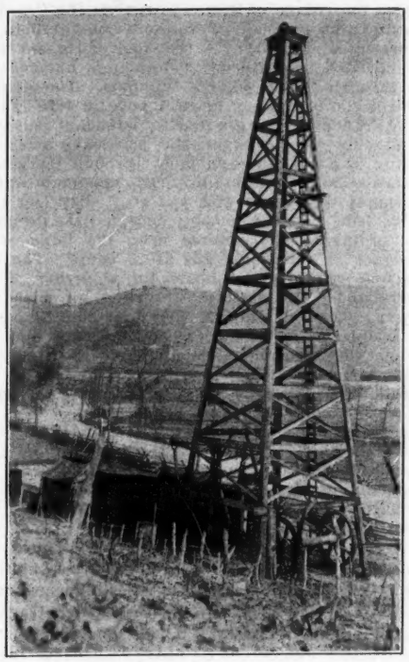
A. W. Leonard is the custodian, in the office of the Devonian Oil Company at Tulsa, Okla., of about a foot of a brass-coated hickory sucker-rod that saw all the ups and downs of a well on the Clapp farm, in Venango county, Pa., drilled in 1860 and pulled in 1902. The screw end carries 14 threads to the inch and the wood is in a state of perfect preservation. That's going some for previous date in petroleum history.

C. W. Mascho, with the Toledo headquarters of the National Supply Company, and G. F. Mahan, western manager for the same company, with headquarters at Independence, Kas., are in Mexico to remain a month for a thorough investigation of conditions involving the petroleum industry there, largely from a manufacturing and selling viewpoint. When those insurrectos discover "Gus" looming large on the horizon it's an even bet they will cease hostilities.

Ross A. Eaton, who for two years has been field and map scout for the Gulf Pipe Line Company, most of the time in the Cherokee division, with headquarters at Bartlesville, has resigned and will devote his time and energy to a general brokerage and advisory business for himself, maintaining an office at Bartlesville, Okla. Ross knows the Oklahoma oil fields by heart and is in position to serve the interests of clients honestly and efficiently, and that fact may be safely remembered, for his energy and judgment are dependable.

J. W. Kelly, of Parkersburg, W. Va., is field manager for a new venture in petroleum in Colombia, South America, being interested with Sir Clifford Sifton, ex-attorney general of Canada. The concession consists of 100 square miles, which might be termed a fair-sized lease. Frank Kiser, known from West Virginia, Illinois and Texas to Oklahoma, is looking after tools and drilling operations. The west coast of South America is gradually increasing its production and development as new capital gets in.

A. H. Tait has resigned from the Abendroth and Root Manufacturing Company and is now connected with the George A. Low Company, of 24 State street, New York, in the capacity of export manager for the Remington Oil Engine Company, of Cincinnati, the American Steam Pump Company



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of Michigan, and other manufacturers. Mr. Tait contemplates a trip to the orient, Australia, Egypt and India, to market his specialties and intends to sail from New York on March 4.

Fred C. Hillman, who has been superintendent of pipe lines and production for the Ohio Oil Company in Illinois during the development of that great oil field, living at Robinson, Ill., most of the time, has accepted the appointment as general manager for the Standard Oil Company in California. Mr. Hillman went to California several weeks ago to see if he would like the work and the country, and, concluding that he did, he signified his acceptance last week, and will at once take charge and Mrs. Hillman is packing up to move. The Hillman family belongs to the petroleum industry, it seems, as W. C. Hillman, father of Fred and H. H., the latter being with the National Supply Company at Vincennes, Ind., has been with the National Supply Company some years and previous to being with the National had been in the business for years. The Illinois field has called for real executive ability, with its rush pipe line, tankage and field work, and no one will deny that Fred Hillman has met the responsibilities with satisfaction to his employers and superiors and preserved the respect and friendship of the producers and all his subordinates in a marked degree. Under J. C. Donnell, Mr. Hillman has succeeded in putting the Ohio Oil Company in possession of more fine producing properties that have profited the company than was ever done in any other new field. In California the Standard Oil Company has had many things to contend with, at a great distance from headquarters, but the promises that state holds out for development of producing and transportation facilities undoubtedly appeal to the company and it is anxious to secure the services of a broad-gauged man of good executive ability and who also has had extended personal experience with the practical details of the business. In Fred Hillman it has evidently found the man for the place, for he has risen to every opportunity heretofore presented. He is halter-broke and gaited.

RECENT DEATHS

James Stillwell died at Warren, Pa., February 27, from the effects of a stroke sustained several years ago, aged 50 years, survived by the widow. Mr. Stillwell had been manager at Warren for the Oil Well Supply Company during a period of fifteen years.

P. C. Fredericks, one of the best known men connected with the petroleum industry in the eastern fields, died the last week in January at his home in Zeniople, O. He was a great prospector, because of which fact his friends sometimes called him "Dry Hole Fred," but he never allowed his failures to check his optimism and friendliness for his fellowmen.

Ollie I. Hall was found dead in his room at Oil City, Pa., February 21, aged 38 years, having been born at Petroleum Center, Pa., a son of Ellis Hall the nitroglycerin manufacturer who died several months ago. Deceased had been subject to epileptic attacks and it is believed death resulted from one of these. There is reason to believe that the disease was induced by the absorption into the system of nitroglycerin, as previous to the appearance of the attacks in 1897 deceased had been employed in the glycerin factory almost from childhood and had been known to lick drops of the fluid from his hands.

Leigh S. Gordon, superintendent of the Gulf Pipe Line Company in Texas and Louisiana and that company's main line in Oklahoma, died at his residence in Beaumont, Texas, Friday, February 24, at 11:40 p. m., from pneumonia. Mr. Gordon was taken sick Friday, February 17, but was not considered seriously ill until the early part of last week, when he took a turn for the worse, remaining in a semi-conscious state until his death. Mr. Gordon was born in Tidioute, Pa., February 28, 1873. He came to Texas in June, 1907, resigning from a position with the Indiana Pipe Line Company to accept the position with the Gulf Pipe Line Company he held until his death. He had been employed by the Standard Oil Company for a continuous period of over 18 years, holding the position of district foreman in Indiana and Illinois, having been stationed at Stony, Ill., prior to coming to Texas. He was the son of W. P. Gordon, for many years superintendent of the North Lima division of the Buckeye Pipe Line Company, Findlay and Toledo districts, and who died about four months ago. He is survived by his mother, widow, and sister Anna. "Lee" was a hustler in the fullest sense of the word, was exceptionally capable in his line of work and was considered one of the best pipe line superintendents in the country. He was extremely popular with his associates, well liked by his men and it will be a long time before the personal loss now felt by his friends will be forgotten. Services were held at his late residence Saturday night and were largely attended, the floral tributes being many and beautiful. A. M. Bowman, purchasing agent for the Gulf Pipe Line Company, a personal friend of many years' standing, accompanied the remains and his family to Toledo, where he will be buried.

IN THE COURTS

Chester G. Bond, a Jackson, Tenn., attorney, has brought suit, in Chicago, against the Standard Oil Company of Indiana for $130,000, claimed to be due for services rendered in the trial of a suit against the oil company in Tennessee.

Upon application of several stockholders, the Allentown (Pa.) circuit court appointed Harry E. Graffin, of Catasauqua, receiver of the Slatington (Pa.) Gas Company. The bill in equity states that the company is bonded at $65,000, and besides defaulting in interest the past year, owes $3,300 to various banks.

In the suit of Edward A. Bailey vs. John A McShane and Creighton McShane Oil Company, an agreed judgment was entered in the district court at Beaumont, February 10, whereby the defendants pay to the plaintiff $7,125. Defendants acquire title to 3,428 acres of land in Hardin county, known as the Elisha Duncan survey.

The case of the Louisville Gas Company vs. Kentucky Heating Company, has been reversed by the Louisville court and a new trial ordered. The jury, at former trial, gave a verdict of $75 000 to the Kentucky Heating Company, because of the alleged using of natural gas in the manufacture of lampblack in such quantities as to injure the heating company's business, by diminishing its supply of gas. The new trial is ordered on the grounds of incompetent evidence, and because size of verdict indicated "passion and prejudice" on the part of the jury.

George L. Eckert, receiver for the Dollar Oil and Gas Company, an Ohio stock promotion, filed his final report in court. The assets of the company consisted of one oil well on a town lot in Junction City and oil in the Buckeye pipe line. All of these have been converted into money, the material at the well having been sold for more than appraised value. The indebtedness of the company consists of three preferred claims, making a total of $2,221.30, and other claims amounting to $63.15. There now remain in the hands of the receiver the sum of $1,554.91, which is 70 per cent of the amount of the several claims.

A suit has been filed in Montgomery county, Kansas., by D. S. and C. Cook against the Calumet Oil and Gas Company, the People's Gas Company, the Kansas Natural Gas Company, the Southern Development Company, the Coffeyville Crude Oil Company, N. H. Bailey, the Brymer-Maloney Salvage Company and L. L. Bingaman. The plaintiffs sue for a payment alleged to be due on an oil and gas lease on their farm. The lease was given the Southern Development Company and the Southern Development and Improvement Company, in March, 1903. Then the Coffeyville Crude Oil Company came along and claimed a right to the lease. In 1904, L. L. Bingaman, of the latter company drilled some wells on the land. They have not been pumped for a number of years, and in 1906 the casing was pulled and the wells abandoned. No oil has been sold from the lease since that time. The plaintiffs want $5,100 to pay for the rental of the lease.

The case in the Licking county (Ohio) court, styled the village of Granville against the Crawford Natural Gas Company, heretofore submitted to the court upon demurrer to the answer, is an interesting case and probably before it is finished will go through all the higher tribunals. The petition alleges the passage of an ordinance in 1898, whereby a franchise was granted to defendant company, embracing certain rights and privileges as to the laying of gas mains and pipes through the streets of the village of Granville. That defendant agreed to supply the village with gas at 25 cents per 1,000 cubic feet. That defendant accepted the terms of the ordinance and entered upon the filing of its contract by furnishing gas at 25 cents. The contractual relation was made for a period of ten years under the statutes providing for such contracts. That on June 2, 1908, the council passed an ordinance fixing the rate at 15 cents, and providing that consumers should have the option to take gas at meter or flat rates, and providing a maximum flat rate. The statutes provide that council may regulate the price, and if they regulate the price for a period of ten years, and if the company accepts the price fixed by council, by ordinance, that makes a binding contract with the company for ten years. The court sustained the demurrer and entered a decree for plaintiff. Notice of appeal was filed.

A San Francisco report brings to light a considerable mix-up in the affairs of two half-way affiliated oil companies. The sheriff has returned to the superior court a writ of attachment against the interests of Messrs. Wilson and Enginger in the Palmer Junior Oil Company, issued at the instance of the Palmer Oil Company. A coincidence in this particular part of the involved litigation is, that both Wilson and Enginger have charged, in affidavits on file, that Brown is withholding moneys due Brown, Wilson & Company (a New York corporation) from the Palmer Junior Oil Company. The suit of the Palmer Oil Company was filed January 17 last, but under the law must be kept secret until the return of the attachment. In it the Palmer Oil Company alleges that Wilson and Enginger on August 1, 1908, obtained from it $1,000 on a written evidence of debt, and that no part of the same has been paid. The attachment of the Wilson and Enginger interests in the Palmer Junior Oil Company was served upon J. C. Kempvan, vice-president of the Palmer Junior Oil Company, January 18, and the answer returned by him was that he would hold any sums of money due Wilson and Enginger until further orders of the court. The case still appears to be "somewhat involved."

The Casper (Wyoming) *Press*, in mildly congratulating the citizens of that town upon the likelihood of securing natural gas through the medium of a pipe line franchise to the Midwest Oil Company, incidentally furnishes a unique item of news. According to the *Press*, the Midwest Oil Company is a holding, or parent, organization that desires to have an oil refinery at Casper and a six-inch pipe line from the Salt creek oil field, 50 miles north, and has asked permission, by franchise, to lay the pipes under the city streets, without bonus or other concession from the city. This, for a western promotion, seems rather unusual, but it is further stated that the oil and the gas from the field will both be brought to the refinery through the same line at the same time, where they will be separated and the gas deflected through pipes to the homes for heating and illumination. If we had not witnessed the flights of biplanes and monoplanes we could hardly stand for this innovation.

The California Independent Producers' Agency is to be congratulated for having contracted 2,555,000 barrels of oil to the Associated Oil Company at 42.5 cents, to be delivered within one year—7,000 barrels a day. There is no sympathy coming to any one because of this deal.

If there is anything that has been omitted in this issue of THE JOURNAL that should have appeared, we promise to print it as soon as we think of it.

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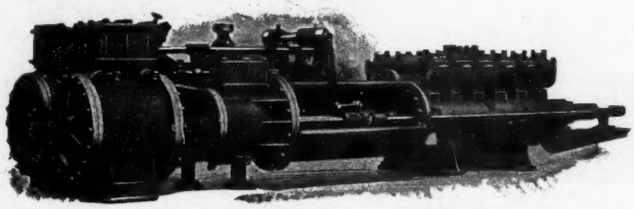

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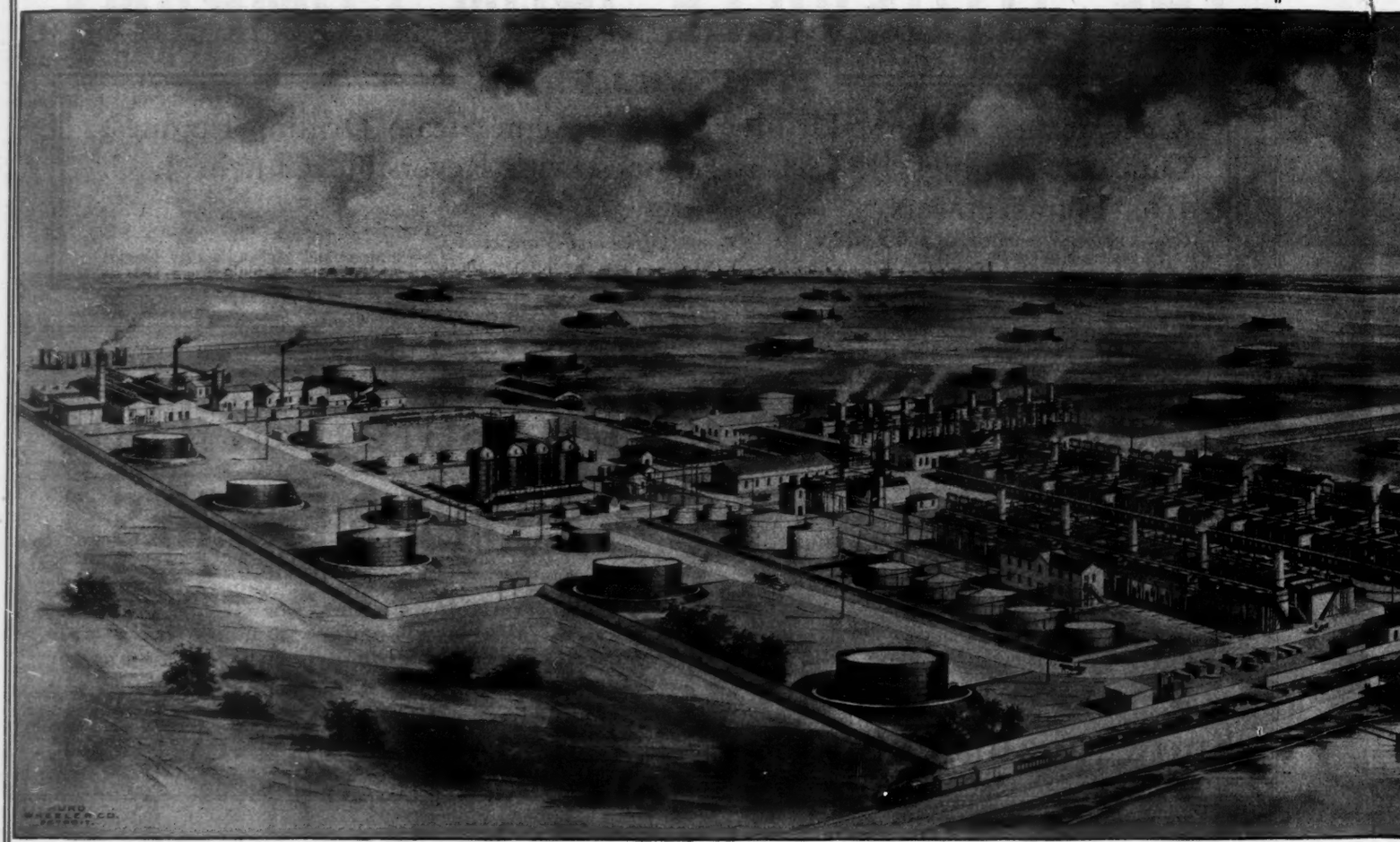

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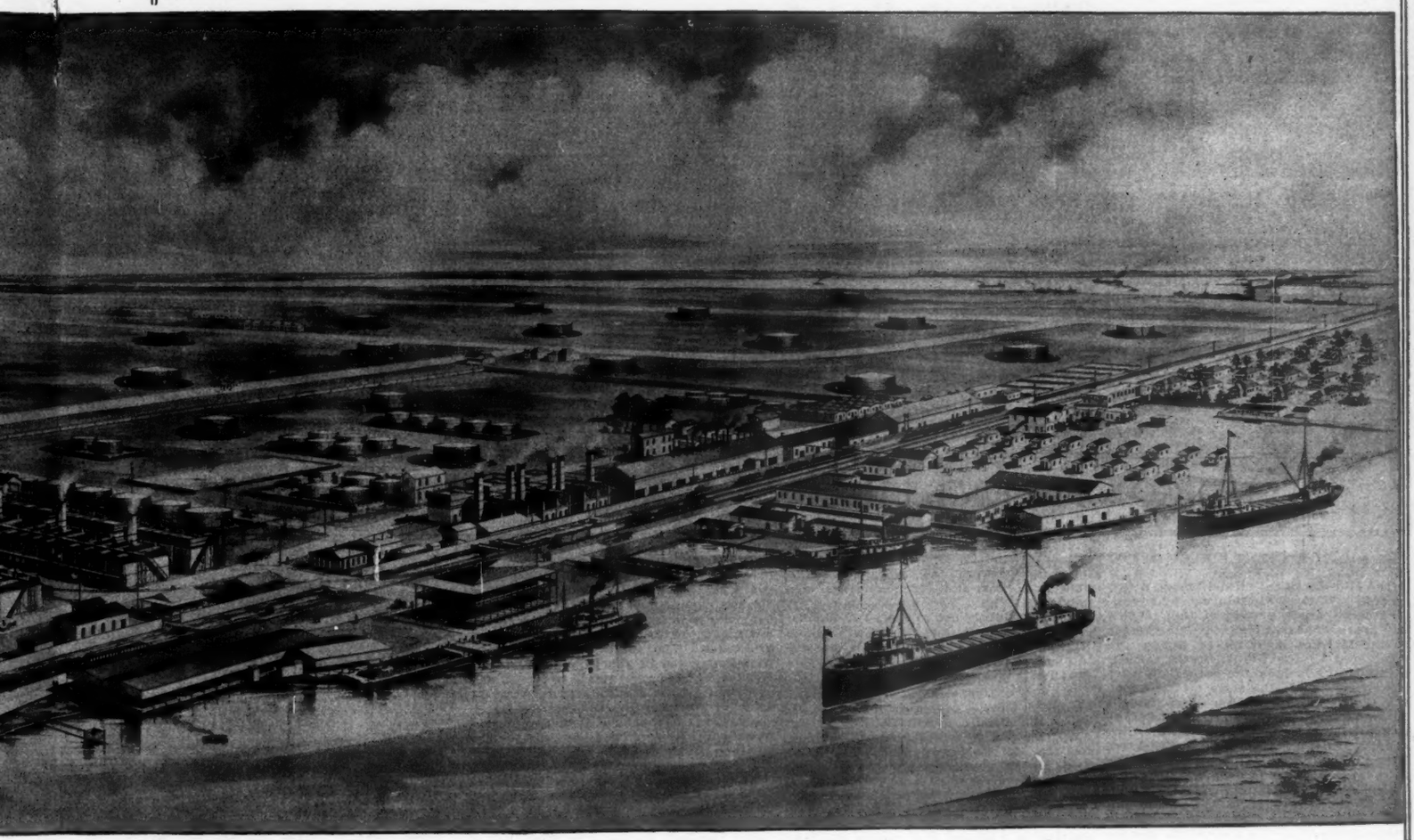

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Summary of Field Operations, 1910

In the following tables will be found a summary of field operations in every producing region in the United States, by months, covering the number of wells completed, the new production, the number of nonproductive wells, either dry or gas, these two items in some cases consolidated, with a recapitulation consolidating all fields:

All Fields, United States.

	Comp.	Prod.	Dry	Gas
Allegany, N. Y.	283	368	13	51
Bradford	342	905	6	20
Middle Field	235	442	34	6
Venango-Clarion	770	1,276	70	85
Butler-Armstrong	263	1,489	89	22
S. W. Penn.	286	2,136	76	59
W. Virginia	1,616	74,966	280	416
S. E. Ohio	1,489	17,626	468	76
Lima Field	582	6,748	58	13
Indiana	365	8,665	66	16
Ky.-Tenn.	121	829	41	....
Illinois	2,149	93,256	387	83
Oklahoma	3,882	232,888	423	174
Kansas	430	1,832	88	272
N. Texas	158	2,155	63	24
Caddo	218	118,190	51	37
Gulf Coast	525	81,563	131	4
California	1,013	317,184	173	3
Total	14,727	962,518	2,517	1,331

APPALACHIAN REGION.

	Comp.	Prod.	Dry.
January	398	6,297	122
February	359	3,819	113
March	373	4,481	124
April	479	5,320	177
May	562	5,622	170
June	582	5,189	192
July	520	3,582	174
August	460	3,296	161
September	437	4,042	134
October	411	2,843	151
November	393	2,633	124
December	322	1,531	146
Total	5,296	48,655	1,788
1909	8,542	79,570	2,209
1908	6,903	52,560	1,756

KENTUCKY.

	Comp.	Prod.	Dry.
January	4	15	3
February	10	110	4
March	3	50	0
April	11	79	4
May	13	149	2
June	18	97	9
July	17	69	10
August	9	60	6
September	9	33	5
October	11	54	5
November	9	81	1
December	7	38	2
Total	121	829	41

WEST VIRGINIA.

	Comp.	Prod.	Dry	Gas
January	146	4,413	11	35
February	123	2,059	20	22
March	122	1,992	22	27
April	146	2,689	33	42
May	153	1,985	25	38
June	157	2,533	25	43
July	148	1,702	25	43
August	129	1,500	32	32
September	137	2,643	23	35
October	132	1,442	23	39
November	108	1,410	16	38
December	115	598	25	42
Total	1,610	24,966	280	416

INDIANA FIELD.

	Comp.	Prod.	Dry	Ab'd.
January	18	488	9	61
February	33	886	6	66
March	29	820	3	221
April	27	714	6	140
May	25	746	5	157
June	38	1,745	4	146
July	38	676	4	76
August	41	1,159	9	126
September	35	400	7	305
October	26	480	5	80
November	35	290	17	100
December	20	261	7	128
Total	365	8,665	82	1,606
1909	305	3,863	88	2,407
1908	402	3,258	80	1,930

LIMA FIELD.

	Comp.	Prod.	Dry	Ab'd.
January	29	377	5	47
February	27	425	3	56
March	31	500	5	169
April	46	530	6	138
May	55	565	9	115
June	57	447	7	112
July	59	684	7	79
August	56	735	5	110
September	56	794	6	130
October	44	441	6	125
November	69	723	6	218
December	45	524	6	201
Total	574	6,745	71	1,500
1909	871	8,118	85	1,046
1908	848	8,621	80	848

ILLINOIS FIELD.

	Comp.	Prod.	Dry	Ab'd.
January	111	5,331	17	...
February	158	6,840	43	5
March	128	5,593	29	3
April	157	7,260	41	10
May	192	8,091	43	6
June	211	9,267	50	14
July	172	6,386	43	17
August	245	10,042	41	2
September	234	8,419	48	7
October	198	10,133	30	7
November	177	8,832	39	8
December	166	7,062	38	5
Total	2,149	93,252	462	84
1909	3,198	89,696	488	...
1908	3,574	78,960	500	...

OKLAHOMA.

	Comp.	Prod.	Dry	Gas
January	262	15,840	25	29
February	317	17,935	48	25
March	325	20,925	42	13
April	348	18,932	41	14
May	407	21,810	44	17
June	408	27,673	46	28
July	286	17,105	30	7
August	269	16,685	16	3
September	307	19,123	51	14
October	331	18,660	25	11
November	339	18,100	31	5
December	253	20,160	24	8
Total	3,882	232,888	423	174
Total, 1909	3,340	152,859	402	135

KANSAS.

	Comp.	Prod.	Dry	Gas
January	45	....	9	36
February	47	95	8	35
March	32	65	12	27
April	40	95	10	26
May	47	170	11	31
June	27	35	4	22
July	36	235	5	23
August	30	195	4	19
September	25	202	7	9
October	49	305	9	26
November	28	210	5	12
December	24	225	4	6
Total	430	1,832	88	272
Total, 1909	510	1,438	98	345

CADDO.

	Comp.	Prod.	Dry	Gas
January	13	425	2	2
February	12	1,315	1	7
March	12	4,995	1	4
April	20	3,295	9	9
May	15	10,125	2	4
June	17	20,000	6	..
July	17	7,070	..	..
August	30	11,920	10	3
September	21	30,485	8	1
October	14	10,140	..	..
November	21	13,125	5	3
December	25	5,300	7	4
Total	218	118,190	51	37

NORTH TEXAS.

	Comp.	Prod.	Dry.
January	12	82	3
February	14	125	3
March	19	77	1
April	18	83	8
May	15	43	3
June	20	1,004	8
July	22	54	12
August	12	26	4
September	20	50	6
October	8	9	6
November	12	62	5
December	6	500	5
Total	158	2,155	63

GULF COAST REGION.

	Comp.	Prod.	Dry	Gas
January	58	3,143	15	..
February	36	3,200	11	..
March	55	1,480	9	..
April	56	8,780	20	..
May	53	3,325	18	2
June	42	5,107	11	..
July	50	9,770	12	1
August	41	4,265	10	1
September	37	6,575	7	..
October	33	5,290	7	..
November	28	16,925	4	..
December	36	13,703	7	..
Total	525	81,563	131	4
Total, 1909	401	46,000	188	9

MID-CONTINENT FIELDS

OKLAHOMA, KANSAS, NORTHWESTERN LOUISIANA NORTH TEXAS

THE MID-CONTINENT FIELDS IN 1910.

The Mid-Continent oil field made a new record in 1910, by producing and shipping more crude petroleum than during any previous year. The fields now known as the Mid-Continent region, and so denominated by the United States Geological Survey, include the states of Kansas on the north, the state of Oklahoma, the Caddo field in northwestern Louisiana and northeastern Texas, the Corsicana field in central Texas and the Clay county field at Petrolia, in northwestern Texas. This consolidation of so great an area into one generic field designation is logical and not easily avoidable, by reason of the character of the formations and the crude oil. Caddo ranks highest in the grade of oil but the specific gravity of the crude produced in Kansas, Oklahoma, Corsicana and Petrolia is quite similar, ranging from 32 to 40 degrees Beaume, with a fraction of the output in each state and field testing below 30 degrees, the exception proving the identity of the formations and their deposits. It is only during 1910 that Caddo has been incorporated with the Kansas and Oklahoma fields, because prior to that time no light oil was produced there, and the statistical tables have not been carefully arranged as yet.

In the four states named there was completed in 1910 4,656 wells, of which number 615 were failures and 494 were gas wells, and the initial new production was 330,534 bbls. Deducting the 1,109 dry holes and passers, there were 3,547 producing oil wells drilled during the year, making an average per week of 93 1-6 bbls. Five gushers were drilled at Caddo that had an initial production ranging from 10,000 to 20,000 bbls., but they soon subsided, so that during the late months of the year the production of the field, as indicated by the pipe line runs, car shipments and tankage filled, is now around 20,000 bbls. a day. Oklahoma and Kansas, as indicated by the pipe line runs and car shipments, are now producing 125,000 bbls. a day, with Kansas producing not to exceed 3,000 bbls. of it. Corsicana and Petrolia produce 1,100 bbls. a day. These figures make a total of 146,000 bbls. for the Mid-Continent field.

In 1910 Oklahoma and Kansas produced 49,459,739 bbls., Caddo produced 5,680,000 bbls., and Corsicana and Petrolia 525,843 bbls., making a total of 55,665,582 bbls. for the Mid-Continent field. The same fields in 1909 produced 46,272,582 bbls., denoting an increase of 9,393,000 bbls., not counting the heavy oil produced in 1909 at Caddo, which was counted in the Gulf Coast region. Although this total production is 3,000,000 bbls. under the 1909 production in California and the Mid-Continent fields have been forced into second place by the phenomenal gusher production of California, it is a rather notable increase, for, leaving the 5,680,000 bbls. of Caddo oil out of the calculation, Oklahoma and Kansas alone showed a gain in 1910 of 3,678,962 bbls. over 1909, in the face of an unprecedented drouth and a steady development for six years—almost a new record in oil-field history.

Mid-Continent Completions, 1910.

	Comp.	Prod.	Dry	Gas
January	320	16,265	36	67
February	402	19,552	62	68
March	381	22,562	56	42
April	424	22,364	59	50
May	484	32,208	60	54
June	462	48,752	64	50
July	359	24,464	46	31
August	341	28,826	34	28
September	373	29,860	72	27
October	402	28,974	40	37
November	400	31,479	46	22
December	308	25,210	40	18
Total	4,656	330,534	615	494

More wells were completed in May than any other month in 1910, the greatest production was reported in June, more dry holes were drilled in September and more gas wells in January. December reported 176 less completions than May, with January the next lowest month and also the low month of the year in production and dry holes. The same number of wells were completed in February and October. Drilling became very active in April, May and June, when a slight increase in the price of oil caused producers to lessen their work in the hope that the market would continue to stiffen. In July the dry weather began to affect the water supply and drilling was interfered with.

At the beginning of 1910 the production of Oklahoma and Kansas was estimated by many persons to be 150,000, as a little of the oil was at that time not being taken regularly by the pipe lines, but in May all the oil produced in the two states was regularly taken as fast as produced and the production began to decline and the normal decrease has been accelerated by the dry weather ever since. December runs averaged 125,131 bbls. a day.

The year began with one pipe line company paying 35 cents, another 33 and another 30, but in March The Texas Company quoted 36 cents, was met by the Gulf Pipe Line Company and raised to 38 cents by the Prairie Oil and Gas Company, remaining at that quotation until July, when The Texas Company quoted 40 cents, met by the Prairie and the Gulf companies. In October The Texas Company again increased its quotations to 42 cents and was met by the other two companies, the price standing at that figure until January 2, 1911, when the Prairie Oil and Gas Company quoted 44 cents and was met by The Texas and the Gulf companies. Several local refiners have been paying a premium of two to three cents above the market price for a year, one buyer at Okmulgee offering five cents above the market price, and one other buyer offered five cents premium.

Oklahoma Statistics.

The following tables show the number of wells completed, new production, dry holes and gas wells, by months in 1910, in Oklahoma and by districts, with 1909 totals:

	Comp.	Prod.	Dry	Gas
January	262	15,840	25	29
February	317	17,935	48	25
March	325	20,925	42	13
April	348	18,932	41	14
May	407	21,810	44	17
June	408	27,673	46	28
July	286	17,105	30	7
August	269	16,685	16	3
September	307	19,123	51	14
October	331	18,660	25	11
November	339	18,100	31	5
December	253	20,160	24	8
Total	3,882	232,888	423	174
Total, 1909	3,340	152,859	402	135
Difference	542	20,029	21	39

In the following table will be found the completions and dry holes and gas wells, by months, in the Cherokee division, the deep sand column including the districts of Copan, Wann, Dewey, Bartlesville, Hogshooter, Ochelata, Collinsville, Skiatook and Bird Creek down to Tulsa, with the shallow sand areas at Copan, Wann, Dewey and Ochelata included. The shallow sand belt includes Delaware, Childers, Nowata, Coody's Bluff, Alluwe and Chelsea:

	Deep Sand Comp.	Dry. Gas.	Shallow Sand Comp.	Dry. Gas.
January	80	32	100	8
February	75	29	130	11
March	90	24	124	11
April	92	14	151	14
May	126	15	164	19
June	118	25	162	18
July	91	10	127	12
August	101	5	85	2
September	78	15	126	20
October	106	14	141	7
November	120	8	129	10
December	88	8	109	9
Total	1,165	199	1,548	141

	Osage. Comp.	Osage. Dry Gas	Creek Comp.	Creek Dry Gas	Miss. Comp.	Miss. Dry Gas
Jan.	11	1	68	12	3	1
Feb.	10	3	91	25	..	..
March	9	..	100	18	2	2
April	12	2	91	24	..	..
May	28	4	82	20	7	3
June	17	1	103	25	8	5
July	11	3	57	12	..	..
Aug.	18	..	63	11	2	1
Sept.	26	6	73	22	4	2
Oct.	48	7	36	8	..	..
Nov.	38	6	52	12	..	..
Dec.	22	3	32	8	2	2
Total	250	36	848	197	28	16

Kansas.

In the following table will be found the completions, production, dry holes and gas wells drilled in 1910 in Franklin, Allen, Neosho, Wilson, Montgomery, Chautauqua, Labette and Cowley counties, Kansas:

	Comp.	Prod.	Dry	Gas
January	45	.....	9	36
February	47	95	8	35
March	32	65	12	27
April	40	95	10	26
May	47	170	11	31
June	27	35	4	22
July	36	235	5	23
August	30	195	4	19
September	25	202	7	9
October	49	305	9	26
November	28	210	5	12
December	24	225	4	6
Total	430	1,832	88	272
Total, 1909	510	1,438	98	345
Difference	80	394	10	73

Caddo, La.

The Caddo district completed almost twice as many wells in 1910 as in 1909, but the new production was about fifteen times as great, a number of spectacular gushers attracting almost international attention, the high-grade oil being first found last year. The year's production reached 5,680,000 bbls. and was maintained at 20,000 bbls. a day for several months, but declined to 14,000 bbls. at the close of the year. Whether it can be maintained at a stage in excess of that figure is yet problematical, but wildcatting is going on in every direction to discover more gusher territory. The heavy-oil production of the Caddo field has been somewhat neglected in the production and search for the paraffin grade, as is evidenced by the stocks that accumulated during the year, reaching the 2,000,000 bbl. mark, with strong probability that they will not exceed that figure, as three pipe lines were laid from the field to the Gulf and to the Mississippi river, and the demand for that grade of refining crude will be supplied as rapidly as possible.

	Comp.	Prod.	Dry	Gas
January	13	425	2	2
February	12	1,315	1	7
March	12	4,995	1	4
April	20	3,295	9	9
May	15	10,125	2	4
June	17	20,000	6	..
July	17	7,070	..	..
August	30	11,920	10	3
September	21	30,485	8	1
October	14	10,140	..	..
November	21	13,125	5	3
December	25	5,300	7	4
Total	218	118,190	51	37
Total. 1909	121	8,750	33	19

PIPE LINE STATEMENTS.

The following tables show the business done in Oklahoma and Kansas in 1910 by the Prairie Oil and Gas Company, being its pipe line runs, shipments or deliveries to the trade, the quantity put into and taken out of tankage and the stocks on hand, by months:

RUNS.

	Bbls.	Daily Avg.
January	2,529,475.26	81,595.97
February	2,106,895.06	75,246.25
March	2,646,312.18	85,364.91
April	3,256,164.53	108,538.82
May	2,756,856.35	88,930.85
June	2,703,612.03	90,120.40
July	2,704,767.91	87,250.58
August	2,600,718.36	38,894.14
September	2,606,582.68	86,886.09
October	2,643,217.15	85,265.07
November	2,487,644.66	82,921.49
December	2,545,066.42	82,078.92
Total	31,587,315.59	86,540.59
Total, 1909	28,772,734.90	78,829.41
Increase	2,814,580.69	7,711.18

DELIVERIES.

January	2,700,362.26	87,108.46
February	2,293,697.28	81,917.76
March	2,609,582.48	84,180.08
April	2,633,425.20	87,780.84
May	2,649,538.38	85,468.97
June	2,791,573.20	93,052.45
July	2,844,335.87	91,752.77
August	2,445,627.20	78,891.20
September	2,257,953.90	75,265.13
October	2,868,329.56	92,526.76
November	2,875,479.30	95,849.92
December	2,998,293.34	96,719.14
Total	31,961,197.97	87,564.97
Total. 1909	26,856,722.80	73,580.06
Increase	5,104,475.17	13,984.91

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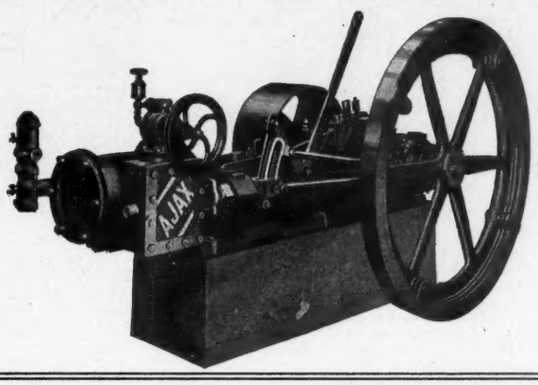

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TAKEN OUT OF TANKAGE.

January	170,887.00	5,512.49
February	186,802.22	6,671.51
June	87,961.17	2,932.05
July	139,567.96	4,502.19
October	225,112.41	7,261.69
November	387,852.64	12,928.43
December	453,226.92	14,620.22
Total	1,651,410.32	4,524.41
Total, 1909	804,208.15	2,200.29
Increase	847,202.17	2,324.12

TANKED.

March	36,729.70	1,184.83
April	622,739.33	20,757.93
May	107,317.97	3,461.87
August	155,091.16	5,002.94
September	348,628.78	11,620.96
Total	1,270,506.94	3,480.84
Total, 109	1,685,426.63	4,620.34
Decrease	414,869.69	1,139.50

STOCKS.

January 1, 1910	40,644,660.41
February 1	40,411,908.00
March 1	40,199,205.88
April 1	40,563,370.85
May 1	41,227,352.13
June 1	41,463,530.94
July 1	41,647,746.92
August 1	41,652,060.01
September 1	41,773,926.31
October 1	42,028,857.43
November 1	41,577,946.20
December 1	40,939,373.42
January 1, 1911	40,275,143.80
Decrease	369,416.61

Runs And Deliveries of Oklahoma Crude By the Gulf Pipe Line Company and The Texas Company.

1910	Runs	Deliveries
January	1,303,188	1,179,160
February	1,167,280	1,114,972
March	1,485,710	1,303,324
April	1,302,539	1,201,176
May	1,283,578	1,178,008
June	1,374,579	1,203,934
July	1,358,089	1,283,335
August	1,330,446	1,320,370
September	1,185,779	1,302,201
October	1,115,155	1,280,531
November	1,081,735	1,195,997
December	1,087,726	1,150,205
Totals	15,075,804	14,713,213
Totals, 1909	15,698,139	13,361,556

All Other Lines.

The following tables show the runs of The Texas Company, the Gulf Pipe Line Company, all the local lines and refineries in Oklahoma and Kansas, and car shipments by producers in 1910, by months, and does not include the storage oil shipped for fuel use and previously entered into regular runs:

	Bbls.
January	1,765,520
February	1,814,570
March	1,898,220
April	1,747,745
May	1,852,375
June	2,016,550
July	1,990,034
August	1,940,000
September	1,713,000
October	1,628,000
November	1,345,600
December	1,340,010
Total	21,073,634
Total, 1909	17,033,640
Increase	4,039,994
Daily average	57,735

The Gulf Pipe Line Company in 1910 handled in round numbers 7,915,000 bbls. of Oklahoma crude, a daily average of 21,000 bbls., about 2,000,000 bbls. more than it did in 1909, and its stocks remain practically the same, perhaps increased a few thousand barrels during the year.

The Texas Company handled in round numbers 7,160,000 bbls. of Oklahoma crude in 1910, a daily average of 20,000 bbls., and approximately 500,000 bbls. less than in 1909. Its stocks were increased about 200,000 bbls. during the year.

In Kansas twenty-two refineries and several local pipe line companies, mostly small shipments by rail, handled Oklahoma and Kansas crude in 1910, 5,990,000 bbls., a daily average of 16,400 bbls., all of it being delivered for immediate consumption; an increase over 1909 of 2,806,680 bbls.

In the spring of 1910 the railroads increased the rates on crude oil after most of the heavy shipments had stopped because of the completion of a pipe line to Louisiana and the sale of a property from which 100,000 bbls. a month had been shipped, and car shipments gradually declined until they will not exceed 2,000 bbls. a day.

Mid-Continent Runs, 1910.

The following tables show the pipe line runs and shipments, including deliveries of all crude, in 1910 in Oklahoma, Kansas, Caddo and Corsicana and Petrolia (the Mid-Continent region), with daily averages:

*Includes Kansas.	Runs	Shipments
Oklahoma	48,364,739	51,372,049
Kansas	1,095,000	1,095,000
Caddo, La.	5,680,000	3,680,000
Corsicana and Petrolia, Tex.	525,843	520,843
Total	55,665,582	57,168,392
Total, 1909	46,272,582	43,352,566
Increase	9,393,000	13,815,826
Daily average runs	152,508	
Daily average shipments	156,571	
Difference	4,063	
Shipments exceeded runs, 1910	1,481,095	
Oklahoma daily average runs	132,565	
Oklahoma daily average shipments.	142,193	
Decrease in Oklahoma pipe line stocks, 1910	181,903	

Oklahoma and Kansas.

The following table shows the runs, shipments and stocks, all Oklahoma and Kansas lines, some lines that do not make regular reports being estimated:

1910	Runs	Shipments	Stocks
January	4,282,095	4,541,682	53,979,908
February	3,692,465	4,154,267	53,678,548
March	4,523,012	4,653,302	53,548,258
April	5,123,914	4,584,915	54,087,257
May	4,618,856	4,421,538	54,194,575
June	4,700,162	4,719,590	54,570,185
July	4,623,802	4,762,369	55,034,060
August	4,541,318	4,386,227	53,773,926
September	4,319,582	3,970,953	54,028,897
October	4,271,217	4,218,329	54,306,857
November	3,883,250	4,221,084	53,919,005
December	3,879,066	4,332,293	53,465,779
Total, '10	49,459,739	52,967,549	50,613,309
Total, '09	45,780,777	42,860,761	54,093,530
Difference	3,678,962	10,106,788	3,410,222

Total Runs and Deliveries of Oklahoma Crude by Trunk Pipe Lines, Prairie Oil and Gas Company, Gulf Pipe Line Company and The Texas Company.

1910	Runs	Deliveries
January	3,832,663	3,879,522
February	3,274,175	3,408,669
March	4,132,022	3,912,906
April	4,558,704	3,834,601
May	4,040,434	3,827,546
June	4,078,191	3,995,507
July	4,062,657	4,127,671
August	3,931,164	3,765,997
September	3,792,362	3,560,155
October	3,758,372	4,148,861
November	3,569,380	4,071,494
December	3,632,792	4,148,498
Totals	46,663,116	46,681,427
Totals, 1909	44,471,866	40,218,279

Oklahoma Crude Transferred by Car by Gulf Pipe Line Company and The Texas Company to Gulf Coast Storage.

January	106,294
February	88,360
March	201,870
April	103,667
May	6,926
June	5,942
July	5,960
August	2,012
September	16,271
October	10,669
November	10,156
December	7,553
Total	565,680

Stocks of Oklahoma Crude Held by Trunk Pipe Lines in Oklahoma, December 31, 1910.

	Dec. 31, 1910	Dec. 31, 1909
*Prairie O. & G. Co.	40,275,143.80	40,644,660.00
†Gulf P.L. Co., and The Texas Co.	7,338,166.00	7,449,070.00
Producers' stocks (est.)	3,000,000.00	6,000,000.00
Totals	50,613,309.80	54,093,530.00
Decrease in 1910		3,410,220.20

*Includes Kansas stocks.

†Does not include stocks of Oklahoma crude held by these companies in Texas.

Stocks of Crude Oil Held by Pipe Line Companies in Oklahoma, Texas and Louisiana, December 31, 1910.

In Oklahoma—Prairie Oil and Gas Co., Gulf Pipe Line Co. and The Texas Company	47,613,310
***In Texas**—Gulf Pipe Line Co., The Texas Company, Sun Pipe Line Company and John Sealy & Co., (at Corsicana and Petrolia only)	5,424,228
†**In Louisiana**—The Texas Company and Gulf Refining Company of Louisiana	1,967,630
Total stocks	55,005,978
Producers' stocks (est.)	3,000,000
Total, all stocks	58,005,978
Oklahoma crude in eastern lines.	2,240,000
Totals	60,245,978

*Includes Texas, Oklahoma and Louisiana crudes.

†Does not include stocks of Standard Oil Company at Caddo or at Baton Rouge.

NOTE:—In addition to the stocks in Texas held by the pipe lines as above stated, the Higgins Oil and Fuel Company, and Rio Bravo Oil Company (at Saratoga and Sour Lake) held 255,170 barrels of crude on December 31, 1910.

Texas Fields in 1910

A Decrease in Production, But Expansion in Products and Movement.

(Data Prepared by Holland S. Reavis.)

Markham, a small and isolated pool many miles from the regular Texas fields, with a little help from Sour Lake, saved Texas from a considerable decline in production in 1910, but the year closed with every producing field decreasing. Unless new producing area of capacity is discovered the State's oil production will be on a lower basis than at any time since the principal districts became prominent. There is abundant room for other pools and as much license to expect them as there was for the spectacular ones that have already caused the world to marvel. Prospecting is going on all over the State, and it is within the range of probability to expect some results during the year.

Up to January 1, 1911, the total crude oil production of Texas had reached a total of 146,897,619 bbls., valued at $67,411,185, the maximum annual output having been reached in 1905, when the total was 28,136,189 bbls., valued at $7,552,262, although the value record was in 1907, when, with less production than in 1905, the output had a value of $10,401,863. Famous Spindletop, that has produced a total of 41,775,547 bbls. — phenomenal for a pool less than 250 acres in area—dropped to third place in 1910, Humble taking the lead with 2,527,985 bbls., its 1909 production having been 3,183,822 bbls. Sour Lake, in second place, came nearer maintaining its production than any other Texas district, its output in 1910 being 1,511,669 bbls., compared with 1,651,525 bbls. in 1909. Spindletop's 1910 production was 1,166,896 bbls., as against 1,368,107 bbls. in 1909, several 600 to 800-bbl. wells helping to break the decline. Markham, which in June, 1908, showed gusher symptoms and soon spluttered out, late in 1910 had a revival and furnished several 5,000-bbl. wells and helped save the day, its total output in 1910 being 476,687 bbls., compared with 28,574 bbls. in 1909. With the exceptions noted, all the old Gulf Coast fields in South Texas showed a falling off.

During 1910 Texas produced 8,603,862 bbls. of crude, the 1909 production having been 9,256,972 bbls., a decrease of 653,110 bbls., including the light oil produced in Navarro and Clay counties in North Texas. These figures do not jibe with some government statistics, but they cover the actual production of the State. The beginning of 1911 finds only declining pools in every part of the producing area and any expansion of the producing branch of the industry seems now to be wholly dependent upon the opening of one or more good pools. Beginning with Markham, in new territory nearly a hundred miles southwest of the regular fields, which is again in the doldrums, Hoskins Mound is not now a producing factor, having quit last summer, and Piedras Pintas, in the extreme southwestern corner of the State, Big Hill, Columbia and the Mission field at San Antonio and the other "shows" have dropped out of sight. A few light wells seem to be producing in McCulloch county, near Brady and Brownwood, but there does not appear to be evidence of much in these remote pools. While Powell, in Navarro county, Central Texas, increased its output in 1910, the field is again dropping off, and Petrolia, in Clay county, North Texas, with an occasional flurry resulting in a good well or two, is "scratching." Western Texas, near Toyah, in Reeves county, and at Electra, farther east, is showing, but is only in the prospect class as yet, with possibilities. Aguilares, near Laredo, developed some good gas wells during 1910, and a fair gas showing was recently got at Moran, in Shackleford county, in the central northern part of the State. In the extreme northeastern part of Texas a spur of the Caddo field showed several good wells and prospecting goes on that may develop additional production, but all these sections are played as long shots so far.

The commercial and industrial branch of the industry — the refining, the transportation and the distributing and marketing end—can tell a more favorable story, with a steady expansion of pipe line systems, refineries and distributing stations, where investment takes on a more pronounced permanency and impresses itself as a fixture and an advantage to the community. Beginning with their entry into the Oklahoma fields, the Gulf Pipe Line Company and The Texas Company, with their affiliated producing and refining organizations, have steadily increased their investments and fixtures and aggressively entered new territory, adding materially to the volume of 1910 business. The remarkable spurt in the Caddo field last year caused the construction of several hundred miles of trunk pipe line, stations, terminals, tankage, etc., all having a common rendezvous in Texas, for water advantages, and the important extensions of the same systems in Oklahoma, diverging toward the same common center, have easily offset any lessening of the producing industry.

Car shipments of crude and manufactured fuel oil in and from South Texas points in 1910 amounted to 6,843,401 bbls., compared to 5,727,068 bbls. in 1909. Houston led as the principal shipping point, with 1,403,107 bbls. loaded by the Gulf Pipe Line Company and 1,398,254 bbls. by The Texas Company, a total of 2,801,361 bbls. From the Beaumont district 1,207,407 bbls. of fuel oil were moved by rail, nearly 1,000,000 bbls. of this quantity originating from the refinery of John Sealy & Company, formerly the Security Oil Company, and most of it going to the Union Sulphur Company at its mine near Sulphur, La. This plant is one of the heaviest fuel-oil users in the country, its daily requirements being points the car shipments of crude and fuel oil amounted to 3,468,864 bbls. in 1910, of this quantity nearly 3,000,000 bbls. starting from the refinery of The Texas Company at West Dallas around 3,000 bbls. From North Texas (Gates).

Vessel shipments of crude and fuel oil from Port Arthur, Sabine and Beaumont amounted to 5,507,390 bbls. in 1910 as compared with 6,188,893 bbls. in 1909, a decline of 681,503 bbls. for the year. The Gulf Refining Company at Port Arthur loaded considerably more than half the total vessel shipments, its record for the year being 3,182,153 bbls. of crude and fuel oil, The Texas Company's 830,051 bbls., the Sun Pipe Line Company's 1,250,320 bbls. of crude shipped to its refinery at Marcus Hook, Pa., from Sabine; the Higgins Oil and Fuel Company's 127,890 bbls. of crude from Beaumont and 57,439 bbls. from Sabine, and John Sealy & Company's 59,537 bbls. of fuel oil from Sabine.

In the item of vessel shipments of refinery products other than fuel oil, the Gulf Refining Company led with 3,044,236 bbls. from Port Arthur. The Texas Company moved 2,001,945 bbls. of refinery products other than fuel oil from Port Arthur, and John Sealy & Company shipped 154,825 bbls. from Sabine, the total by all companies being 5,201,006 bbls.

The gross total of car and vessel shipments of crude and fuel oil from Texas in 1910 was 15,819,655 bbls., compared with 14,838,609 bbls. in 1909, a gain of almost 1,000,000 bbls. A good part of the manufactured fuel oil going to make up this volume was made from Oklahoma crude, piped to the state and tidewater by the Gulf Pipe Line Company and The Texas Company and treated at their refineries in Texas. The total quantity of Oklahoma crude piped by these companies to Texas in 1910 was 14,713,213 bbls. (exact figures). The amount of crude oil treated in Texas refineries in 1910 (excepting that of the Texas City Refining Company at Texas City, of

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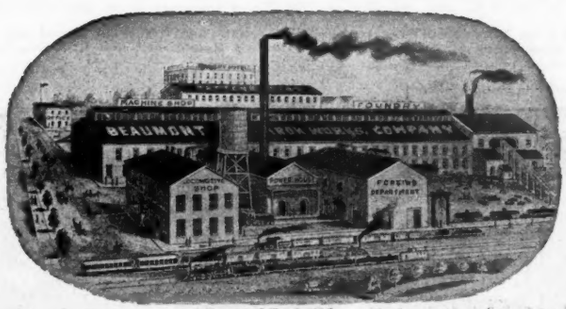

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which no record is available) was 19,880,227 bbls., against 15,854,077 bbls. in 1909, an increase of 4,026,150 bbls., or 25 per cent.

Stocks of crude oil held by The Texas Company, the Gulf Pipe Line Company, the Sun Pipe Line Company and John Sealy & Company in Texas (including all grades of crude—Texas, Oklahoma and Louisiana), on January 1, 1911, amounted to 5,424,228 bbls., an increase of only 180,158 bbls. during the year—an evidence of the trade demands. In addition, the Higgins Oil and Fuel Company and the Rio Bravo Oil Company (at Sour Lake and Saratoga) held 255,170 bbls.

The Texas market, except at Corsicana in North Texas, remained practically stationary during the year, most of the oil in South Texas having been contracted for late in 1909 by the pipe lines for the full year at 75 to 80 cents at the wells. These contracts were renewed late in 1910 for the current year at 75 to 77½ cents. Corsicana crude, which was quoted at 70 cents at the beginning of 1910, was reduced to 58 cents at the close of the year. Powell and Petrolia (Henrietta) crudes were quoted throughout the year at 53 cents.

[NOTE.—The accompanying tables relate almost exclusively to the heavy-oil districts of the Gulf Coast region, the light-oil statistics of North Texas appearing, under the Texas head, in their own division. A crude petroleum barrel, the unit of computation, is 42 gallons. A refined barrel contains 50 gallons.]

Quantity and Value of Oil Produced in Texas.

Year	Barrels produced	Value	Av. Value per bbl.
1896	1,450	$ 1,050	$ .720
1897	65,975	37,662	.570
1898	546,070	277,135	.508
1899	669,013	473,443	.708
1900	836,039	871,996	1.043
1901	4,393,658	1,247,150	.284
1902	18,083,658	3,998,097	.221
1903	17,955,572	7,517,479	.418
1904	22,241,413	8,156,220	.367
1905	28,136,189	7,552,262	.268
1906	12,567,897	6,565,578	.522
1907	12,322,696	10,401,863	.844
1908	11,217,155	6,730,298	.600
1909	9,256,972	7,220,438	.780
1910	8,603,862	6,360,514	.739
Totals	146,897,619	$67,411,185	

ALL VESSEL SHIPMENTS OF REFINED PRODUCTS OTHER THAN FUEL OIL FROM PORT ARTHUR AND SABINE, 1910.

	Port Arthur—Gulf Ref. Co.	Port Arthur—The Texas Co.	Sabine—John Sealy & Co.*	Total Port Arthur & Sabine.
Jan.	274,474	84,688	33,465	392,627
Feb'y	221,474	149,522	87,273	458,269
Mch.	216,892	141,520	.....	358,402
April	293,492	118,627	.....	412,119
May	495,712	154,651	.....	350,363
June	335,670	104,232	.....	439,902
July	249,637	221,522	.....	471,159
Aug.	232,779	258,575	.....	491,354
Sept.	277,030	220,921	12,118	510,069
Oct.	326,465	152,408	.....	478,863
Nov.	280,522	230,834	21,989	533,325
Dec.	140,109	164,445	.....	304,554
Totals	3,044,236	2,001,945	154,825	5,201,006
T't'ls '09	3,059,579	1,312,220	*862,199	5,233,998

*Security Oil Co.

VESSEL SHIPMENTS BY GULF REFINING COMPANY FROM PORT ARTHUR, 1910.

	Crude and Fuel Oil	Refinery Products other than Fuel Oil	Total Shipments.
Jan.	313,229.89	274,474.05	587,703.74
Feb.	211,921.47	221,474.44	433,395.01
March	377,188.64	216,882.26	524,070.90
April	255,304.68	293,492.04	548,796.72
May	312,333.31	195,711.52	508,044.83
June	253,431.23	335,669.70	589,100.93
July	271,996.98	249,637.49	521,634.47
Aug.	137,907.36	232,778.72	370,686.08
Sept.	284,641.64	277,029.68	561,671.32
Oct.	239,516.76	326,454.90	565,971.66
Nov.	271,577.43	280,522.06	552,099.49
Dec.	253,104.25	140,109.01	393,213.26
Totals	3,182,153.44	3,044,235.87	6,226,389.31
T't'ls, '09	3,359,765.23	3,059,578.50	6,419,343.73

VESSEL SHIPMENTS BY THE TEXAS COMPANY FROM PORT ARTHUR, 1910.

	Crude and Fuel Oil	Refinery Products other than Fuel Oil	Total Shipments.
Jan.	52,602	84,688	137,290
Feb.	57,282	149,522	206,804
March	41,539	141,520	183,059
April	5,545	118,627	124,172
May	22,451	154,651	177,102
June	46,884	104,232	151,116
July	66,907	221,522	288,429
Aug.	149,507	258,575	408,082
Sept.	125,101	220,921	346,022
Oct.	52,951	152,408	205,359
Nov.	146,046	230,834	376,880
Dec.	63,236	164,445	227,621
Totals	830,051	2,001,945	2,831,996
T't'ls '09	1,185,728	1,312,220	2,497,948

ALL RUNS OF HEAVY CRUDE IN TEXAS TO JANUARY 1, 1911.

Year	Powell	Sp'top	Sour Lake	Saratoga	Batson	Dayton	Humble	Markham	Others	All Fields
1900	6,479	.....	.....	.....	.....	.....	.....	.....	.....	6,479
1901	37,121	3,593,113	.....	.....	.....	.....	.....	.....	.....	3,630,234
1902	46,812	17,420,949	44,838	.....	.....	.....	.....	.....	.....	17,512,599
1903	100,143	8,600,905	8,848,150	.....	4,518	.....	.....	.....	.....	17,553,725
1904	129,329	3,433,842	6,442,357	739,239	10,904,737	.....	.....	.....	151,936	21,801,440
1905	132,866	1,652,780	3,362,153	3,125,028	3,774,841	60,294	15,594,310	.....	46,471	27,748,743
1906	673,221	1,077,942	2,156,010	2,182,057	2,289,507	92,850	3,571,445	.....	80,591	12,123,623
1907	596,897	1,699,943	2,353,940	2,130,928	2,164,453	108,038	2,929,640	.....	29,286	12,013,125
1908	398,649	1,741,070	1,580,655	1,700,986	1,584,500	39,901	3,777,316	28,574	66,330	10,917,981
1909	233,037	1,388,107	1,651,545	1,206,113	1,206,213	17,647	3,183,822	60,869	50,851	8,998,204
1910	270,106	1,166,896	1,511,669	1,134,695	1,122,421	9,672	2,527,985	476,687	127,924	8,348,125
Total	2,624,660	41,775,547	27,951,326	12,219,046	23,051,260	328,402	31,584,518	566,130	553,389	140,654,278

RUNS OF CRUDE OIL, HEAVY AND LIGHT, FROM ALL TEXAS DISTRICTS, 1910.

1910.	Humble	Sour Lake	Spindletop	Saratoga	Batson	Markham	Other fields	Total S. Texas	Powell, N. Texas	All heavy crude	N. Texas light cr'de	Total all Tex. fields
January	237,642	112,906	116,423	116,325	90,961	2,376	14,264	690,896	23,706	714,602	22,084	736,686
February	195,609	98,202	104,233	89,070	84,495	2,235	29,726	603,570	20,712	624,282	22,602	646,884
March	223,012	109,198	106,828	90,328	91,778	1,766	42,193	665,103	25,115	690,218	25,639	715,857
April	215,373	112,193	106,750	87,270	87,287	3,500	13,115	625,488	24,556	650,044	21,644	671,688
May	223,586	122,916	102,260	141,832	96,392	4,895	11,111	702,992	22,335	725,327	21,904	747,231
June	192,425	147,741	90,595	88,875	98,400	7,177	6,332	631,545	23,481	655,026	21,450	676,476
July	204,646	136,553	87,425	93,610	104,905	8,134	4,123	639,396	22,028	661,424	18,546	679,970
August	206,271	138,010	85,252	93,832	100,019	44,844	3,642	671,870	23,553	695,423	20,807	716,230
September	186,014	143,585	85,505	88,565	90,215	50,670	3,217	647,771	21,210	668,981	19,385	688,366
October	230,107	132,399	96,274	82,301	97,333	57,380	3,330	699,124	21,519	720,643	19,284	739,927
November	209,560	126,286	92,607	81,264	89,258	86,968	3,426	689,369	21,454	710,823	17,746	728,569
December	203,740	131,681	92,744	81,423	91,448	206,742	3,117	810,895	20,437	831,332	24,646	855,978
Total	2,527,985	1,511,669	1,166,986	1,134,695	1,122,491	476,687	*137,596	8,078,019	270,106	8,348,125	255,737	8,603,862
Totals 1909	3,183,822	1,651,525	1,368,107	1,206,113	1,206,213	28,574	100,793	8,765,167	233,037	8,998,204	258,768	9,256,972

*Includes 100,652 bbls. from Hoskin Mound; the remainder from Dayton, Piedras Pintas and Goose Creek.

ALL CAR SHIPMENTS OF CRUDE AND MANUFACTURED FUEL OIL, FROM SOUTH TEXAS POINTS, 1910.

	Houston (G. P. L. Co.)	Trice (Houston) (T. T. Co.)	Beaumont District	Humble	Saratoga	West Pt. Arthur	Markham	Sour Lake	**Miscellaneous	Total S. Texas
January	96,144	108,230	106,913	50,365	.....	83,814	1,653	38,663	13,146	498,928
February	85,799	110,435	160,518	46,351	.....	58,601	2,408	30,281	10,960	505,353
March	107,811	146,621	162,271	66,080	.....	61,637	1,253	18,880	39,297	603,850
April	95,785	147,449	159,256	63,633	3,076	6,347	1,837	16,347	11,766	505,496
May	108,295	133,311	123,872	93,769	18,619	5,992	2,552	30,927	5,533	522,870
June	114,517	145,376	145,600	75,542	19,776	25,322	3,348	22,382	9,428	561,291
July	133,302	98,096	100,082	85,554	67,971	28,879	5,855	27,090	12,666	559,495
August	139,027	97,194	44,145	117,194	87,025	61,362	51,742	6,286	4,757	608,732
September	137,546	86,687	34,527	68,889	62,703	53,731	49,385	14,104	307	507,879
October	112,506	118,121	58,134	46,011	105,814	86,961	55,160	5,174	.....	587,881
November	112,200	100,958	77,796	72,937	93,466	30,776	110,731	3,537	118	602,519
December	160,175	105,776	34,293	117,285	109,149	35,970	215,379	.....	1,071	779,107
Total	1,403,107	1,398,254	*1,207,407	903,610	567,599	539,401	†501,303	213,671	109,049	6,843,401
Totals 1909	308,345	1,570,865	698,352	1,774,622	265,552	393,771	.....	659,804	55,757	5,727,068

*All shipped on T. & N. O. R. R. from racks of John Sealy & Company, The Texas Company and Gulf Pipe Line Company, excepting 9,328 bbls. on the Santa Fe, loaded by Higgins Oil and Fuel Company.

†December shipments from Markham, as listed above, include 33,473 bbls. shipped by The Texas Company from Bay City on the St. L., B. & M. Ry.

**Miscellaneous shipments include 78,743 bbls. shipped by barge from Mud Island, Intercoastal Canal (Hoskins Mound oil); 6,237 bbls. by barge from Goose Creek; 22,216 bbls. by car from Danbury on St. L., B. & M. Ry. (Hoskins Mound oil); and 1,853 bbls. by car from Noleda on the Texas-Mexican Ry. (Piedras Pintas oil).

BARTLESVILLE, OKLA., OIL MEN.

Front Row, Left to Right—S. C. Moss, Nephy Coburn, Jno. J. Larkin, W. H. Heydrick, D. E. Wood. Back Row—J. F. Maloney, R. R. Glasgow, W. H. Mainwaring, C. B. Fulton, Jno. Dyson, Geo. Akin, F. M. Overlees.

*CRUDE OIL CHARGED TO STILLS (RUNS OF CRUDE OIL) BY TEXAS REFINERIES IN 1910.

January	1,616,009
February	1,329,782
March	1,444,307
April	1,609,161
May	1,741,432
June	1,511,062
July	1,605,820
August	1,718,440
September	1,861,384
October	1,978,794
November	1,734,642
December	1,729,394
Total	19,820,227
Total, 1909	15,854,077

*Includes works of Gulf Refining Company at Port Arthur, The Texas Company at Port Arthur, Gates (West Dallas) and Port Neches, and John Sealy & Company at Beaumont and Corsicana. Runs by Texas City Refining Company at Texas City, Tex., not included either in 1909 or 1910 figures.

ALL SHIPMENTS OF CRUDE AND MANUFACTURED FUEL OIL FROM TEXAS AND LOUISIANA.

1910	All car and vessel shipments from Tex.	All car and vessel shipments ing Standard Oil Co.'s points	Louisiana, except- from Baton Rouge	Total Tex. and Louisiana
January	1,341,674	233,747		1,575,421
February	1,174,643	242,535		1,417,178
March	1,457,957	249,493		1,707,450
April	1,170,264	277,166		1,447,430
May	1,272,986	436,990		1,709,976
June	1,253,139	659,645		1,912,784
July	1,239,045	476,956		1,716,001
August	1,317,686	434,336		1,752,022
September	1,346,126	530,826		1,876,952
October	1,257,650	443,012		1,700,662
November	1,476,229	497,784		1,974,013
December	1,512,256	459,179		1,971,435
Totals	15,819,655	*4,941,669		20,761,324
Totals, '09	14,838,609	2,392,065		17,230,674

*Includes 1,563,158 bbls. transferred by car from Caddo and Jennings to Texas storage by Gulf Refining Company, of Louisiana, and The Texas Company; also car shipments by John Sealy & Company from Caddo to Corsicana and Beaumont, Texas, for refinery use.

MISCELLANEOUS SHIPMENTS FROM SOUTH TEXAS. 1910.

	Hoskins Mound, by barge	Goose Creek, by barge	Danbury & Noleda, by car	Total
January	12,154	221	767	13,146
February	10,960	.....	.....	10,960
March	17,136	.....	22,161	39,297
April	10,625	.....	1,141	11,766
May	5,533	.....	.....	5,533
June	7,747	1,682	.....	9,428
July	11,815	851	.....	12,666
August	2,773	1,984	.....	4,757
September	.....	307	.....	307
October	.....	.....	.....	.....
November	.....	118	.....	118
December	.....	1,071	.....	1,071
Totals	78,743	6,237	*24,069	109,049

*Includes 22,216 bbls. of Hoskins Mound crude loaded at Danbury on the St. L., M. & B. Ry. and 1,853 bbls. of Piedras Pintas crude loaded at Noleda on the Texas-Mexican Ry.

NORTH TEXAS.

PRODUCTION OF LIGHT OIL IN TEXAS.

Year—	Corsicana	Powell	Petrolia	Totals
1896	1,450	.....	.....	1,450
1897	65,975	.....	.....	65,975
1898	544,620	.....	.....	544,620
1899	668,483	.....	.....	668,483
1900	829,560	6,479	.....	836,039
1901	763,424	37,121	.....	800,545
1902	571,059	46,812	.....	617,871
1903	401,817	100,143	.....	501,960
1904	374,318	129,329	65,455	569,102
1905	311,554	132,866	75,592	520,012
1906	333,922	673,221	111,072	1,118,215
1907	243,311	596,897	83,260	914,468
1908	216,535	398,649	82,639	697,823
1909	146,905	233,037	111,863	491,805
1910	132,706	270,106	123,031	525,843
Totals	*5,596,629	2,624,660	652,912	8,874,211

*Includes 14,500 bbls. produced in South Bosque in 1906, 1907 and 1908.

The light oil fields of North Texas—Navarro county, at Corsicana and Powell, and Petrolia, in Clay county—maintained their average fairly well in 1910, compared with 1909 and the several preceding years, both in development and production. In the Corsicana field only a few wells were drilled and that part of the district is now practically confined to pumping the old producing wells, except in the southern part of the area an occasional light gasser is drilled. There was considerable activity in the eastern end of the district, at Powell, several spurs calling out renewed drilling, with the result that the production was increased considerably, 37,000 barrels more than in 1909, but late in the year these spurs had been drilled out and very little new work was in evidence.

Corsicana and Powell combined produced 525,843 barrels in 1910, of which total Corsicana, denominated light oil because of higher specific gravity, is credited with 132,707 barrels and Powell, the heavy oil district, 270,106 barrels. In 1909 Corsicana produced 146,905 barrels, 14,199 barrels more than in 1910, while Powell, in 1910, reported 270,106 barrels and in 1909 233,037 barrels, an increase of 37,068 barrels, the total increase of the Navarro county field in 1910 being 22,869 barrels, which may be called a creditable showing, all things considered.

The Petrolia field, in Clay county, had several flurries during the year and managed to increase its production slightly, and became an important natural gas producer. The old shallow sand devel-

PRODUCTION OF NORTH TEXAS DISTRICTS, 1910.

	Light Oil— Petrolia	Corsicana	Total Light	Heavy Powell	Total N. Texas
January	11,531	10,553	22,084	23,706	45,790
February	9,168	13,436	22,602	20,712	43,314
March	9,857	15,782	25,639	25,115	50,754
April	10,858	10,786	21,644	24,556	46,200
May	10,357	11,547	21,904	22,335	44,239
June	10,417	11,033	21,450	23,481	44,931
July	8,564	9,982	18,546	22,028	50,574
August	9,161	11,646	20,807	23,553	44,360
September	9,490	9,895	19,385	21,210	40,595
October	9,705	9,579	19,284	21,519	40,803
November	8,510	9,236	17,746	21,454	39,200
December	15,415	9,231	24,646	20,437	45,083
Totals	123,031	132,706	255,737	270,106	525,843
Totals 1909	111,863	146,905	258,768	233,037	491,805

ALL CAR SHIPMENTS OF CRUDE AND MANUFACTURED FUEL OIL FROM NORTH TEXAS POINTS, 1910.

	Gates (M'f'd fuel oil)	Eleanor (M'f'd fuel oil)	Corsicana (Fuel and crude)	Millers (M'f'd fuel oil)	Powell (Crude and fuel)	Petrolia (Crude)	Total N. Texas
January	154,194	92,967	37,922	.....	38,037	10,602	333,792
February	133,648	85,076	27,498	.....	44,792	9,170	300,184
March	154,799	100,414	33,282	.....	38,892	9,835	337,222
April	146,030	85,983	29,900	.....	22,526	9,240	293,679
May	159,749	82,318	10,411	.....	29,719	8,727	290,924
June	162,212	24,639	16,732	.....	49,602	10,936	264,181
July	181,025	2,760	12,997	.....	62,989	12,719	272,490
August	222,952	3,103	36,840	.....	17,686	13,595	294,176
September	196,234	5,338	56,655	.....	20,955	12,768	292,450
October	179,833	5,330	46,952	575	10,396	12,572	255,658
November	153,399	5,569	37,644	5,708	28,745	8,704	290,769
December	131,941	6,004	52,314	10,742	33,346	8,992	243,339
Totals	1,976,016	500,001	449,277	18,025	387,685	127,860	3,468,864
Totals 1909	1,666,991	710,820	124,245	.....	317,463	103,129	2,922,648

ALL VESSEL SHIPMENTS OF CRUDE AND MANUFACTURED FUEL OIL FROM PORT ARTHUR, SABINE AND BEAUMONT, 1910.

	Port Arthur— Gulf Ref. Co. Crude and fuel oil	The Texas Co. Crude and fuel oil	Sabine— Sun P. L. Co. Crude	J. Sealy & Co. Fuel oil	Beaumont— Higgins O. & F. Crude	H.O.& F. Crude	Total all crude and fuel oil
January	313,230	52,602	141,652	.....	1,470	.....	508,954
February	211,921	57,282	93,841	.....	6,062	.....	369,108
March	377,189	41,539	93,621	.....	4,536	.....	516,885
April	255,305	5,545	95,960	.....	14,279	.....	371,089
May	312,333	22,451	94,812	.....	5,830	23,766	459,192
June	253,431	46,884	115,988	.....	2,409	8,955	427,667
July	271,997	66,907	47,737	.....	2,435	17,984	407,060
August	137,907	149,507	120,312	.....	7,052	.....	414,778
September	284,642	125,101	118,095	.....	4,369	13,590	545,797
October	239,517	52,951	93,635	.....	1,390	26,618	414,111
November	271,577	146,046	140,893	.....	5,663	18,762	582,941
December	253,104	63,236	93,774	59,537	1,944	18,215	489,810
Totals	3,182,153	830,051	1,250,320	59,537	57,439	127,890	5,507,390
Totals 1909	3,359,766	1,185,728	1,459,882	.....	54,736	128,781	6,188,893

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opment, limited to a very small area, had dwindled steadily, although the old wells are reliable producers. The finding of heavy volumes of gas in a deep sand formation at about 1,700 feet stimulated prospecting for oil that was believed to exist near the gas, and early in the year the deep sand did develop a 300-bbl. well, but it soon settled to a 25-bbl. pumper of 40 gravity oil, located in the extreme southeastern part of the field. Considerable drilling failed to disclose further evidence of oil, however, until in December, when another well was struck on an adjoining lease that flowed 1,000 bbls. the first day and finally settled to 400 bbls. and is the record producer of the field. Prospecting for gas considerably widened the producing area to the northwest and southeast, but the formation seems to carry oil very sparingly, especially in the deep gas sand. About the same number of rigs are running regularly, mostly for gas, as the demand for that product is active. During 1910 the Petrolia field produced 123,031 barrels of oil, the production in 1909 being 111,863 barrels, an increase for 1910 of 12,168 barrels. The crude is run by the John Sealy & Company people, the distillates being taken off and shipped to the Corsicana refinery and the residuum shipped from Petrolia.

During 1910 the Lone Star Gas Company completed its 16-inch trunk line to Fort Worth and Dallas and began the distribution of natural gas to those two North Texas cities and serving intervening towns. Eighteen producing gas wells are connected to the line, of which there is 125 miles of 16-inch, four miles of 12-inch—the main line—with branch lines of 16 miles of 2-inch, 6 miles of 3-inch, 40 miles of 4-inch and 5 miles of 6-inch pipe. The field lines consist of 2 miles of 2-inch, 7 miles of 4-inch and 7 miles of 6-inch pipe. The Fort Worth Gas Company distributes the gas in Fort Worth, the Dallas Gas Company in Dallas and the North Texas Gas Company is the local distributer in the towns of Byers, Petrolia, Wichita Falls, 18 miles west of the wells, Henrietta, 11 miles south, and to the east Bellevue, Bowie, Sunset, Alvord, Decatur, Bridgeport, Rome and Irving. The intention was for the North Texas Gas Company to distribute the Clay county product in the towns of McKinney, Sherman, Denison and tributary places, but it has not been undertaken. The strongest gas well in the Clay county field showed 30,000,000 cubic feet and a pressure of 700 pounds. Cleburne, 28 miles south of Dallas and Fort Worth, also applied for service. All reports from the cities that are served by the producing and distributing companies indicate satisfactory results and prices and an increasing number of consumers.

Below will be found the tables covering the year's development and pipe line runs, shipments and refinery consumption, for Corsicana, Powell and Petrolia:

WELLS DRILLED.

	Comp.	Prod	Dry	Gas
January	12	82	3	4
February	14	125	3	1
March	19	77	1	2
April	18	83	8	6
May	15	43	3	3
June	20	1,044	8	..
July	22	54	12	2
August	12	26	4	2
September	20	50	6	3
October	8	9	6	..
November	12	62	5	2
December	6	500	5	..
Total	158	2,155	63	24
Total, 1909	169	1,177	44	14
Difference	11	978	19	10

In 1909 Corsicana reported 15 wells abandoned, Powell 28 and Petrolia 15. In 1910 a few wells were abandoned in each field, but not so many as the preceding year by at least half.

PIPE LINE STATEMENT.

Runs	Corsicana. Bbls.	Powell. Bbls.	Petrolia. Bbls.
January	10,552	23,705	11,531
February	13,435	20,711	9,166
March	15,781	25,114	9,857
April	10,786	24,555	10,857
May	11,547	22,335	10,356
June	11,033	23,481	10,417
July	9,982	22,028	8,562
August	11,646	23,552	9,160
September	9,894	21,209	9,489
October	9,578	21,519	9,705
November	9,236	21,454	8,509
December	9,230	20,436	8,827
	132,707	270,106	116,444
Total, 1909	146,905	233,037	111,863

REFINERY SHIPMENTS.

	Corsicana.	Petrolia.
January	30,476	10,602
February	37,994	9,169
March	29,455	9,835
April	13,821	9,240
May	23,288	8,726
June	43,947	10,935
July	54,871	12,719
August	10,489	13,595
September	13,389	12,767
October	3,050	12,572
November	22,705	8,704
December	30,135	8,992
	313,627	127,860

SHIPMENTS TO OUTSIDE PARTIES.

	Corsicana.
January	7,560
February	6,796
March	9,437
April	8,704
May	6,431
June	5,655
July	8,117
August	7,196
September	7,565
October	7,346
November	6,040
December	3,210
	84,058

CRUDE OIL RUN BY REFINERY, 1910.

	Bbls.
January	47,921
February	43,618
March	59,056
April	74,576
May	88,653
June	104,395
July	113,788
August	81,165
September	119,336
October	128,940
November	89,165
December	107,665
Total refined	1,058,286

CRUDE STOCKS, FEB. 1, 1911.

	Bbls.
At Corsicana, heavy oil	63,332
At Corsicana, light oil	106,440
At Corsicana, Oklahoma oil	93,222
At Petrolia, Clay County oil	5,836
Total stocks	268,831

It will be seen from the above figures, a total of 1,058,286 barrels, that the John Sealy & Company plant at Corsicana did a prosperous business in 1910, as compared with previous years, although during the year the entire ownership and plan of operation was changed by the ending of the suits brought by the state of Texas to oust the Waters Pierce Oil Company and all alleged Standard Oil affiliations, the ouster being made effective, and the properties were sold by the state, John Sealy, the Galveston banker and capitalist, purchasing and taking over for operation the Navarro Refining Company's plant and business at Corsicana, and it is now operated as John Sealy & Company. After the Union Tank Line cars were attached in 1907 no further car shipments of Oklahoma crude to Corsicana were made, but the Texas Company furnished the Navarro Refining Company Oklahoma crude from its trunk line from Tulsa to Port Arthur, the line passing near the refinery. The plant has continued to use Oklahoma crude, but after the Oklahoma Pipe Line Company's trunk line was completed through Oklahoma to the Arkansas state line and the Prairie Oil and Gas Company's line through Arkansas to the Louisiana state line near Texarkana the Oklahoma crude came by way of Caddo, with the addition of some Caddo crude, shipped by tank cars. About half the capacity of the plant is occupied with Oklahoma and Caddo crude, as indicated by the above table. Including Oklahoma crude, the refinery stocks on hand February 1, 1911, were 268,831 barrels, compared with 153,472 barrels on January 1, 1910. Shipments to outside parties are miscellaneous fuel oil, or residuum orders.

Louisiana Fields in 1910

The old oil fields of Louisiana on the coast, Jennings being the principal one, have declined to a very small production, but during 1910 the light oil field at Caddo, in the northwestern part of the state, came to the front with some very prolific but short-lived gushers and carried the state's production to a stage almost equal to the high mark in 1905 and 1906, when the output was 8,910,416 and 9,077,528 bbls. respectively, at Jennings. In the closing months of the year, Vinton, in the coastal area, also introduced several gushers that promise increased output, but did not enter much into the statistics of the year under review. Up to January 1, 1911, Louisiana had produced a total of 47,329,618 bbls. of crude oil, valued at $21,801,854. The total production of the state in 1910 was 7,290,396 bbls., increased from 3,224,363 bbls. in 1909, of which total Caddo is credited with 5,654,114 bbls., the 1909 production of that district having been 985,226 bbls., an increase in a few months of almost 5,000,000 bbls., all high-grade oil. The gusher period at Caddo began early in the year and had reached its height in September, with a production of 937,564 bbls., but by December it had declined to 531,207 bbls., the slump continuing into the early months of the present year. At the beginning of 1910 the contract price for Caddo crude, all grades, was 60 cents at the wells, but as the production increased the price went off to 40 cents and the advent of pipe lines put the field practically on a credit balance basis and the quotations were made identical with Oklahoma, and 44 cents was posted for the new year.

The Standard Oil Company of Louisiana was the first to establish trunk line connection with the Caddo field, through its connection with the Prairie Oil and Gas Company's Oklahoma trunk line, forming a trunk line to the company's extensive refining plant at Baton Rouge, which began operations early in 1910. Very little Caddo crude, however, was piped to Baton Rouge, where Oklahoma crude was used almost exclusively, the company's Caddo accumulations going to the Beaumont and Corsicana refineries of John Sealy & Company by rail and barge. Late in 1910 the Standard Oil Company completed one of the heaviest deals of the year for Caddo leases and production by purchasing and taking over the J. C. Trees Oil Company's holdings, at a price variously reported but believed to be around $4,500,000.

Complete pipe line facilities for the Caddo field were provided late in the year by the Gulf Pipe Line Company installing a 6-inch line from its properties on the Texas side of the field to Lufkin, forming a connection there with its 8-inch Oklahoma trunk line to Port Arthur. The Texas Company completed an 8-inch line direct from Shreveport to its manifold station at Garrison, Texas, connecting with its Gulf Coast system. This company also established a storage tank farm near Shreveport, where over 1,000,000 bbls. were accumulated, somewhat reduced after the completion of the pipe line. At this time no Caddo crude is being stored, as the three principal pipe line and purchasing companies easily absorb the output of the wells and could use considerably more than is now produced. The Caddo crude is of 43 gravity, a paraffin product, and is a valuable refining oil.

Jennings, once the mainstay of Gulf Coast production, its total output to date having been 39,450,777 bbls.—a close second to Spindletop—had declined to 1,486,647 bbls. in 1910, falling from 2,170,454 bbls. in 1909. The remarkable pool, with an area of less than 200 acres, has had a spectacular history. During the greater part of 1910 the price for Jennings crude, on contracts, was 75 to 80 cents, but late in the year contracts were renewed at 67 to 70 cents by the probability of a heavy increase in production at Vinton, near the Texas line 50 miles west of Jennings.

Vinton made its first bow to the petroleum public in August of 1910, introducing a fair producing well, continuing its activity until late in the year several near-gushers were developed. During January and February, 1911, 5,000 to 10,000 bbl. wells appeared, in a limited area, permitting Vinton to pose as the chief producing district of the Gulf Coast region. The Gulf Pipe Line Company, or the Gulf Refining Company of Louisiana, was the first to put in a three-mile pipe line to the Southern Pacific railroad and in November and December loaded out 39,316 bbls. of Vinton oil. The Texas Company laid a line to the Sabine river and loads Vinton oil in barges for shipment to its refineries and fuel oil stations. The question of Vinton's ability to maintain or to increase its present production of 30,000 bbls. a day is still an open one.

Shipments of Louisiana crude during 1910 amounted to 4,941,669 bbls., of which 3,616,167 bbls. originated at Caddo and was loaded at Lewis, Vivian, Oil City and Mooringsport, handled by the Kansas City Southern railroad, the only line traversing the Caddo field. The total stocks of Louisiana crude held by the pipe lines (except the Standard Oil Company) on January 1, 1911, were 1,967,630 bbls.

QUANTITY AND VALUE OF OIL PRODUCED IN LOUISIANA.

Year	Barrels	Value	Av. value per bbl.
1902	548,617	$ 188,985	$ .344
1903	917,771	416,228	.453
1904	6,718,958	2,438,952	.363
1905	8,910,416	1,601,325	.180
1906	9,077,528	3,557,838	.392
1907	5,068,425	4,114,561	.812
1908	5,573,144	3,455,340	.620
1909	3,224,363	2,257,054	.700
1910	7,290,396	3,771,562	.517
Totals	47,329,618	$21,801,854	

ALL SHIPMENTS OF CRUDE OIL FROM LOUISIANA POINTS, 1910.

	Comercial car shipments of Jennings Oil					Jennings oil shipped by barge and other Deliveries	Total commercial shipments Jennings oil	Car shipments of Vinton oil (Toomey)	Car shipments from Amesville	Car shipments from Lafayette	Total shipments from Coastal Points	*Commercial car shipments of Caddo oil	Co.'s transfers Caddo & Jennings oil to Tex. storage and refineries	Total of Louisiana shipments.
1910.	Mermentau	Jennings station	Egan	Lake Charles	Crowley	Total by car								
January	19,502	8,202	4,179	5,427	.....	37,370	1,098	38,468	.....	4,015	620	43,103	54,710	135,934	233,747
February	34,232	4,728	3,095	6,812	.....	48,865	2,429	51,294	.....	860	620	52,774	68,989	120,772	242,535
March	37,220	6,331	18,677	5,345	.....	68,073	4,133	72,206	.....	.....	619	72,825	60,143	116,525	249,493
April	25,134	30,503	7,428	5,208	750	69,023	9,539	78,562	.....	.....	766	79,328	62,059	135,779	277,166
May	28,456	26,893	9,571	6,385	1,000	72,485	6,630	79,165	.....	.....	1,082	80,247	105,722	251,021	436,990
June	58,854	11,295	11,142	4,030	1,750	87,072	9,639	96,711	.....	.....	1,740	98,451	224,487	336,707	659,645
July	65,425	10,828	2,786	958	250	80,247	1,698	81,945	.....	.....	2,168	84,113	208,871	183,972	476,956
August	86,316	14,287	4,435	2,681	1,250	108,969	4,627	113,596	.....	.....	9,286	122,882	220,766	90,688	434,336
September	83,988	9,917	3,869	1,914	500	100,188	929	101,117	.....	192	4,333	105,642	326,368	98,816	530,826
October	44,711	29,023	4,178	.....	.....	77,912	712	78,624	.....	383	4,024	83,031	337,823	22,158	443,012
November	60,721	11,506	10,904	.....	.....	83,131	1,720	84,851	17,409	.....	1,238	103,498	333,212	61,074	497,784
December	61,556	12,669	6,665	192	.....	81,083	1,331	82,413	21,907	.....	2,187	106,487	342,980	9,712	459,179
Total	606,115	176,180	87,110	4,39,512	5,500	214,417	44,535	958,952	39,316	5,450	28,663	1,032,381	2,346,130	1,563,158	4,941,669

*Includes car shipments by John Sealy & Company to Corsicana and Beaumont, Tex.

RUNS OF CRUDE FROM ALL LOUISIANA DISTRICTS TO DECEMBER 31, 1910.

Year	Jennings	Welsh	Anse la Butte	Caddo	Vinton	Totals
1902	548,617	.....	.....	.....	.....	548,617
1903	892,609	25,162	.....	.....	.....	917,771
1904	6,683,068	35,892	.....	.....	.....	6,718,958
1905	8,891,416	10,000	9,000	4,650	.....	8,910,416
1906	9,025,174	23,996	23,708	.....	.....	9,077,528
1907	4,895,905	47,316	76,938	48,266	.....	5,068,425
1908	4,856,889	31,555	184,763	499,937	.....	5,573,144
1909	2,170,454	26,640	42,043	985,226	.....	3,224,363
1910	1,486,647	47,000	31,726	5,654,114	70,909	7,290,396
Totals	39,450,777	247,561	368,178	7,192,193	70,909	47,329,618

RUNS OF OIL FROM ALL LOUISIANA DISTRICTS.

	Coastal Fields.			Northwest La.	
1910.	Jennings	*Others	Total	†Caddo	Total,La.
January	136,777	4,733	141,510	122,908	264,418
February	114,863	4,867	119,730	154,400	274,130
March	125,263	4,932	130,195	217,325	347,520
April	109,979	5,223	115,202	270,348	385,550
May	112,981	5,477	118,458	400,443	518,901
June	120,320	6,029	126,349	609,622	735,971
July	142,981	6,231	149,212	489,960	639,172
August	130,274	13,523	143,797	421,682	565,479
September	130,604	17,716	148,320	937,564	1,085,884
October	125,007	16,822	141,829	825,627	967,456
November	113,750	26,770	140,520	673,028	813,548
December	123,848	37,312	161,160	531,207	692,367
Totals	1,486,647	149,635	1,636,282	5,654,114	7,290,396
Totals 1909	2,170,454	68,683	2,239,137	985,226	3,224,363

*Includes production of Welsh and Anse la Butte, and 70,909 bbls. from Vinton.
†Includes production of J. M. Guffey Petroleum Company's wells on the Burr farm, in Texas.

COMPARATIVE PRICE TABLE.

Total production, all grades, Mid-Continent crude, 1910.....57,476,036
Mid-Continent heavy to Sept. 20, 263 days, daily average, 7,000 bbls... 1,841,000

Total Mid-Continent, light.....55,635,036
Daily average, Mid-Continent, light 152,425
Daily average, all Mid-Continent 157,469

VALUE MID-CONTINENT CRUDE.

Jan. 1 to March 11—70 days, 10,669,750 bbls. 35c, light.....$ 3,734,412.50
March 12 to Sept.. 2—175 days, 26,674,375 bbls. 38c, light..... 10,136,262.50
Sept. 3 to Sept. 20—18 days, 2,733,650 bbls. 40c, light..... 1,093,460.00
Sept. 21 to Nov. 14—55 days, 8,383,375 bbls. 40c, all..... 3,353,350.00
Nov. 15 to Dec. 31—47 days, 7,113,975 bbls. 42c, all..... 2,987,869.50

$21,305,254.50
Jan. 1 to March 11—70 days, 490,000 bbls. 28c, heavy.....$ 137,200.00
March 12 to Sept. 20—193 days, 1,351,000 bbls. 30c, heavy..... 405,300.00

Total, 57,416,125 bbls.....$21,845,854.50

On March 6 the price of Corsicana and Henrietta oils, in Texas, was advanced from 52 cents to 65 cents. On March 11 the higher grade of Kansas and Oklahoma oils was advanced from 35 to 38 cents and fuel oil from 28 cents to 30 cents. On May 23 the price of Corsicana light oil was reduced to 60 cents. On September 1 Corsicana light was reduced to 58 cents and heavy oil to 53 cents. On September 2 Kansas and Oklahoma oil above 30° was advanced to 40 cents. The price of Caddo was fixed at 40 cents September 7. On September 20, 40 cents was quoted on all grades of Kansas and Oklahoma oils, and on November 14, 42 cents. On November 16 the price of Corsicana oil was reduced 5 cents—light to 55 cents and heavy to 50 cents. The price of Kansas and Oklahoma oils was advanced from 42 cents to 44 cents January 2, 1911. On January 3 the price of Caddo was advanced from 42 to 44 cents.

RAILROAD USE AND SHIPMENT.

The consumption of oil in railroad locomotives is steadily increasing on every road that has been using it and other roads are preparing to use liquid fuel whenever they can be assured of a steady supply. The St. Louis & San Francisco railroad (Frisco system) began the use of refinery residuum in its switch engines four or five years ago at Kansas City and has gradually extended its used until in 1910 it began converting passenger engines for oil-burners and later began converting freight engines, until it has now at least 100 locomotives burning oil, including switch engines at Kansas City, Neodesha and Monett, with passenger and freight engines between Monett, Mo., and Sapulpa, Okla.; Monett and Wichita, Kan., and some between Monett and St. Louis. The superintendent of fuel is extremely well satisfied with the efficiency of liquid fuel, especially in the heavy freight engines, where the test is a severe one. The locomotives do their work easier, last longer and the aggregate cost is less, to say nothing of the elimination of smoke and the uncertainties of coal during strikes. During the strike last year three divisions of the Frisco system had only 24 hours' supply of coal on hand the day the strike was broken. No wonder fuel men on railroads get gray.

The Atchison, Topeka & Santa Fe railroad, which has always been an oil user in California and Texas as far north as Purcell, Okla., in passenger engines, is converting coal-burners into oil-burners on several of its Kansas divisions, especially from Kansas City to Tulsa, and will consume increased quantities of the clean liquid fuel.

The Kansas City Southern railroad last year installed storage tanks on the northern divisions and is now burning oil in passenger engines clear through from Kansas City to Port Arthur, with most of the freight engines also burning it. On the north end residuum is used from the Sugar Creek refinery, and residuum is also taken from Muskogee. The accompanying table shows the quantity of oil thus used in 1910 by the Kansas City Southern system in Missouri, Kansas, Oklahoma, Arkansas, Louisiana and Texas, with a table elsewhere showing the quantity of crude loaded on its rails at Caddo other than that used in its own system:

Consumption of Fuel Oil By Kansas City Southern Railroad in 1910.

1910	Locomotives	Other purposes
January	63,418.45	1,422.65
February	62,798.60	1,576.18
March	74,634.45	2,657.92
April	78,043.10	1,334.92
May	73,902.00	1,077.81
June	71,502.24	1,054.03
July	70,854.30	1,281.96
August	67,595.67	1,085.58
September	69,942.76	1,654.18
October	85,516.70	2,383.44
November	88,407.30	7,165.79
December	95,997.80	6,995.73
	902,613.37	29,696.21
Total		932,309.58

NOTE.—Of the fuel oil purchased by the Kansas City Southern Railroad in 1910, 279,437 bbls. of residuum came from Sugar Creek, Kan.; 140,122 bbls. of residuum from Muskogee, Okla.; 62,545 bbls. of residuum from Texas; 417,039 bbls. of crude oil from Louisiana, all but 33,234 bbls. of this being Caddo crude, and 9,479 bbls. of crude from Texas.

The Frisco system buys residuum from the refineries at Sapulpa, Okmulgee, Tulsa, Chelsea and Muskogee in Oklahoma, and from the Standard's refineries at Sugar Creek, Mo., and Neodesha, Kan., the Santa Fe also buying from these two refineries. The Frisco system uses at least 100,000 bbls. a month, 3,300 bbls. a day, or about 1,205,000 bbls. a year, and will use more as it is obtainable.

The Midland Valley railroad, while it is not a fuel oil consumer, handles large quantities of crude as tonnage, as its road, from Fort Smith, Ark., to Arkansas City, Kan., a distance of 265 miles, passing through the richest part of the

Neill Portable Steel Pipe Derrick

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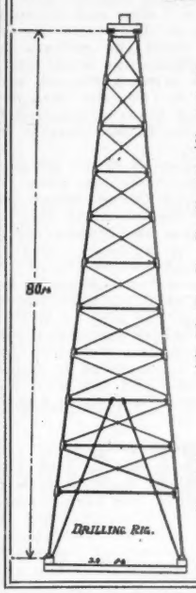

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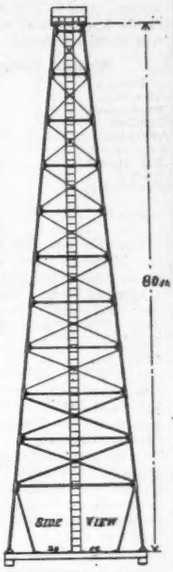

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Oklahoma oil fields from Muskogee to Pawhuska. In 1908, when the Glenn pool was at its zenith, the Midland Valley hauled 15,000 to 20,000 bbls. a day from Jenks and Glenpool stations. It is still doing a profitable business, as the following table indicates, being its 1910 crude and refined oil tonnage—a business which many people did not suspect:

Midland Valley Oil Shipments.

Station	Bbls.
Glenpool	723,218
Muskogee	278,799
Lefeber	180,625
Watkins	175,203
Petroleum	138,783
Big Heart	10,715
Sperry	8,191
Pawhuska	308
Total	1,516,842

The Barnes Oil Company, which sold its holdings last summer, shipped its crude from Glenpool to Beaumont, Tex., averaging over 100,000 bbls. a day up to the time the shipments were discontinued. The Texas Company's refinery at Lefeber, four miles south of Tulsa, is a good patron of the Midland Valley, formerly with crude and now with refined and residuum products. The Gulf Pipe Line Company starts its Midland Valley shipments at Watkins, near Glenpool, the two stations for the Glenn pool. The Sperry shipments are crude for the Muskogee Oil Refining Company. At Big Heart, the Southwestern Refining Company operates a refining plant, and Petroleum, also a station in the Osage reservation near Big Heart, crude shipments originate. Most of the Muskogee shipments are residuum, the Midland Valley delivering it to the Kansas City Southern at Panama, Okla.

OKLAHOMA PICKING UP.

Osage Pool Showing Good — Pawnee County Promising — Good Producers.

TULSA, Okla., Feb. 28.—(Special.)—The recent rains have not yet been sufficient to permit unrestricted drilling in many districts in Oklahoma, but they have helped some and field work has improved and is beginning to show a little in a slightly increased production, especially in the Delaware extension. February was practically a standoff with January in completions, considering the three less days, and production is about the same. As conditions now appear there will be increased activity in the Oklahoma fields and the production will increase in the new Delaware, Osage and Pawnee county districts.

Osage Reservation.

John Newell has completed another well, in the northwest corner of section 29-21-9, offsetting a Barnsdall Oil Company and a Finance Oil Company well, its initial production being 3,000 bbls., a little lighter than the Finance well. The Barnsdall Oil Company is offsetting it to the north, in the southwest corner of section 20-21-9, and an offset also for the Finance well that had an initial production of 5,000 bbls. The Barnsdall Oil Company is drilling in its No. 42, on the east line of section 30, an offset for one of John Newell's wells, likely to be considerably lighter than the real gushers. The same company also has several wells to the west in section 30 that are likely to be strong ones about ready to drill in, and the Finance Oil Company is putting up rigs on three lines and preparing for active development of section 19, which looks to be a very rich lease.

The Sperata Oil Company's well in the center of section 13-21-8, over a mile northwest of production, should have been drilled in yesterday (Wednesday), and the result is held to be quite a determining factor of the probable extension of the rich sand to the northwest. The best estimates of the well as it has been standing for several weeks is 400 to 500 bbls., with the belief that when drilled through the lower pay it will make a fine producer. If it meets the best expectations a large area appears to be proven and a number of leases will be immediately drilled. John A. Bell, senior and junior, Pittsburg and Bartlesville, have made quite a plunge in section 13, having paid, in cash and option agreements, $270,000 for 280 acres, scattered in 20, 40 and 80-acre selections. Their latest purchase was the half interest of Judge J. J. Shea and the quarter interest of H. H. Breene in 120 acres secured from the Sperata Oil Company for drilling the well, conditioned upon its being a 200-bbl. producer, which it is. For the Shea half interest the cash price is reported to be $44,000 and the Breene quarter interest $22,000.

A hitch has occurred in the 400-acre, $10,000 purchase made by John H. Markham, Jr., from Carter, Mason and associates, over the one-ninth interest held by Lou Elyea and transferred to C. K. McFaddin, of Muskogee. Lou Elyea originally had two-ninths of the 1,800 acres, leased five years ago, but transferred half of it for carrying the other ninth, which he sold to McFaddin. Failing to secure amicable recognition of his interest, McFaddin has instituted court proceedings to secure his interest. This land lies west and northwest of the good wells and looks to be good stuff.

Pawnee County.

Interest in the new deep sand possibilities of Pawnee county, south of the Arkansas river, has been intensified by the completion of the Gypsy Oil Company's first test on the Widener farm, southwest corner of the southwest quarter of section 34-20-8, a mile and a half north of the Prairie well on the McNeal farm in section 10-20-8. This well is showing better than the Prairie well, but the exact gauge has not been reported at this writing. It may be called a 250 or 300-bbl. well, according to conservative estimates, as it made several nice flows and has not been shot. Prices for land not leased between the two wells and contiguous have gone up.

The E. A. Ross and associates well in the southeast corner of the southeast quarter of section 4-20-8, on the McFall farm, a little over half a mile northwest of the Prairie well and a mile southwest of the Gypsy well, is a strong gasser in the 2,200-foot sand, at least 7,000,000 feet. The gas was also found in the Gypsy well and in the same formations farther east and north—the old Cleveland gas belt—showing a uniform structure. The gas in the Ross well has been cased off for use and drilling will be continued to the 2,500-foot sand. It is held to prove rather than condemn the field's future.

The Prairie Oil and Gas Company's test on the J. R. Skinner farm, in section 10, three locations southeast of the McNeal well, is nearing the sand, and several other tests, to the east, west and northwest, will soon determine the value of a considerable area. The test on the Thomas farm, section 25-21-8, nearly west of the Barnsdall Osage wells and on the south side of the river, for the Producers Oil Company, is due today. Bets are about even, but if it is a well it will add to the probabilities for a long stretch of producing area and not condemn a great deal if it is a failure.

The Shafer-Smathers test, six miles south of the Prairie well, in Creek county, is not much more than started, but is a very important one, as is the Producers Oil Company's test in section 17-19-9, two miles southeast of Mannford, also in Creek county. Preparations are being made to start a test for the deep sand near Bristow, 15 miles south, also in Creek county.

Lower Creek Results.

The Ruth Oil Company's test in the northeast quarter of section 7-15-13, northeast of Beggs, is showing both oil and gas in the 2,200-foot sand, which was 100 feet in thickness, but the well will hardly make a profitable producer as it stands. However, the company, organized by W. H. Roeser, thinks so well of the showing that another well will be started at once near by. The Oklahoma Natural Gas Company is about due with a test on the Eva Williams land, section 14-14-11, southwest of Beggs, due with one on the Parkinson land, section 25-16-12, northeast of Beggs; D. Hastings is due with one on the L. Bighead land, section 29-16-13, and G. T. Braden is drilling No. 2 on the Russell land, section 22-19-11, north of Sapulpa, for the shallow sand at 1,000 feet.

What is rather an important well is showing good, in the northwest quarter of section 36-13-14, southeast of Morris and east of production, for the Fields Oil and Gas Company. The sand was found at about 1,825 feet and soon after it was drilled into the hole filled up and made several flows, indicating a good producer. The oil is 39 gravity, but richer than the 40-gravity crude found at Preston and Tiger Flats. This location is at the west end of what is known as council hill, an Indian meeting place, and to the east and southeast and south the country breaks into rough and wooded hills that look like an oil country (hunch). A test was drilled four or five miles south of this well a year or so ago, near the M. O. & G. railroad, northeast of Hoffman, which showed an unusually heavy body of sand. The people composing the Fields Oil and Gas Company are not professional oil men and they used home-made "dope" in reaching a conclusion that their location was a logical one to find oil—and they found it, all right.

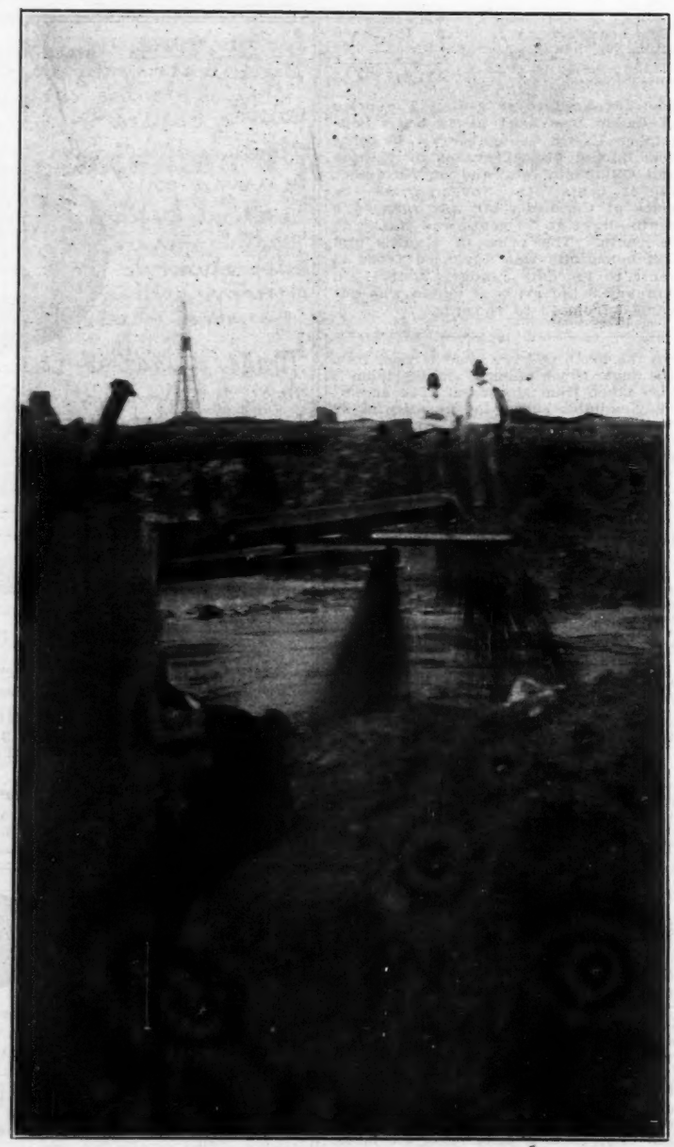
Lucky Dave.

David Gunsburg has another good well on his N. Brinkley lease, section 5-14-18, Muskogee district, No. 13 (ouch), which started at better than 500 bbls., No. 12 making 700 bbls. He now has 1,000 bbls. a day production from this lease. The first two or three tests were dry and the lease laid out for a year or so.

Delaware Development.

The three pipe line companies have been furnishing water for contractors in the Delaware district and it has resulted in renewed activity there in the latter part of February, one firm of operators now running nine drilling machines and others putting in more machines. Many leases in the west end are now being drilled up as rapidly as possible, also in the Lenapah pool, and the new production is showing. Nothing much has been accomplished toward extending the producing area, except a location at a time, but the frontier lines are creeping out farther west and north gradually. Along the west line of the Delaware extension there is some evidence that the sand is beginning to cut off a little on top and most of the wells lack the strength showed to the east. There has so far happened nothing to stop the advance or to condemn its continuance. The test for Markham & White, on the Ollie Vann land, northeast quarter of section 13-27-14, several locations west of anything, is the next guide-post the pioneers are waiting to scan, as its location is likely to betray something new. If it is a good well the talent will play the west stronger.

Gunsburg & Forman are rushing



FLOWING WELL IN VINTON FIELD.
Gulf Refining Company's No. 3, Gardiner-Noble-Gray. Initial production, 4,500 bbls.

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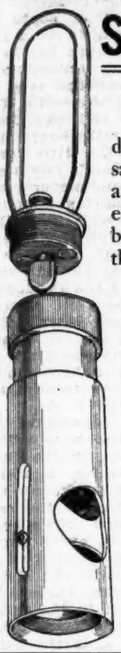

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work on several of their western leases, with good wells showing, occasionally one making 300 bbls., which piles it up quickly. Al and Paul Lovell and associates are also keeping the machines busy on several leases, as are the Prairie Oil and Gas Company, the Belmont Oil Company, Van Vleck & Graham, McMahon, Brown and associates, the Kuny & Company crowd, the Ona Oil and Gas Company and Cheney & Harmon, in the Lenapah pool. Neither the Delaware nor the Lenapah pay streaks are very wide, but they are very productive, and what they lack in width must be obtained in length.

The presence of heavy gas along the northeast edge of the Lenapah pool may indicate about the end of the oil, but toward the north and northwest they are still making good wells stick.

Nothing of special interest has developed in the old districts of the shallow sand field and the drilling is rather desultory, except by two or three companies.

Western Cherokee.

The Henry Gas Company and G. T. Braden keep up a steady campaign drilling for gas in the lower Hogshooter district and get some fine wells. The Braden interests are supplying the Kansas Natural Gas Company with about 40,000,000 feet of gas a day from the Hogshooter and the exhaust has to be renewed. The Henry Gas Company supplies the Bartlesville zinc smelters with 15,000,000 to 20,000,000 feet a day and is asking for a general domestic franchise for Bartlesville, contested by the Bartlesville Gas Company, that has an exclusive franchise.

The Dewey shallow sand belt is just now pretty active working out from the old development and there is considerable work in the deep sand areas, but it is practically all inside stuff and ordinary wells. In the Copan district new leases are being tested and drilled, both shallow and deep sands, but the old-time big wells are not now in evidence. The Wichita Natural Gas Company keeps a rig or two running in the north end for gas to supply its Wichita lines, and the Kasigan Gas Company runs one rig in the Copan-Dewey district.

The affiliated companies of the Central Fuel Oil Company keep pretty busy in the Cherokee districts, running 32 strings of tools in the Cherokee and the Osage districts to maintain the production needed to supply its contracts with The Texas Company and the Southern Pacific railroad company. The Prairie Oil and Gas Company is second to these companies and is likely to be in the lead shortly, as its purchases during last year cover every district in Oklahoma and it must drill offsets, new leases and contract wells. Very little effort is being made to prospect outside of defined limits.

Bird Creek.

About all the work the Producers Oil Company is doing is in the Bird Creek district, where it has a number of leases, and in the Preston district near Beggs. The Gypsy Oil Company keeps busy in the Bird Creek territory and is getting good wells for that district. The Sabine Oil and Marketing Company (Senator Lockwood's organization) is starting work on several Bird Creek leases, where the wells are good stayers. The territory around Skiatook is responding good and the producing area is constantly being extended, a little at a time, with no rush to overdo it.

The Sapulpa Pool.

The Producers Oil Company's test on the King land, section 22-17-11, west of the Glenn pool and south of Sapulpa, located across a 40 southeast of the discovery well, developed into a 400-bbl. well, after being touted as a dry hole, according to depth, as its reported depth of 2,170 feet was supposed to be about 50 feet below the pay in the other wells, although the measurements seem to be rather vague in several of the wells and dry holes there. The same company's test on part of the Johnnie Jack land, across a 40 northeast of the original well, also seems to be a failure at the expected depth, but it may develop like the other one.

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The accounts of those interested in the Caddo Oil Field respectfully solicited.

The Bull Dog Oil Company (the Collinses), drilling in section 15, just north of the wells, got a good gasser in an upper sand and it was shut in. The same company is drilling another test near by for the deep sand. The New York Oil Company (the Letchers) are about due with a test a location south of the good well, also in section 22, and the Boggs Drilling Company should drill in any time at its test on the Clayton land in the southwest corner of section 14-17-11, half a mile northeast of the discovery well. The Deutcher Oil Company is about at the sand in its No. 4 on the Dora Cloud land, section 22, just southwest of the wells, No. 1 having been a light producer and afterward abandoned and Nos. 2 and 3 dry holes. The Florence Oil Company is drilling deeper its well in the Red Fork sand. The Thirteen Oil Company's well, that started at 1,600 bbls., and caused all the excitement, is still flowing 400 bbls., having averaged 900 bbls. a day for 40 days.

Several Sales.

The Gypsy Oil Company (the Gulf Pipe Line Company) has just taken over all the shallow sand holdings of the Iron Mountain Oil Company, amounting to several hundred acres, scattered through the Delaware district, with a daily production of between 1,200 and 1,600 bbls. from about 40 wells. The price paid was $250,000. Jesse Graham & Van Vleck, who were interested in the Iron Mountain company, turn in their part, but reserve a number of leases, and the Iron Mountain company reserves all undeveloped leases. This purchase gives the Gulf Pipe Line Company a good start in the shallow sand field.

Two important deals are under negotiation, that may be closed soon, or may not, involving an extensive acreage and production, and there are more inquiries just now than there has been for several months. This demand has undoubtedly been revived by the recent showings in the Osage reservation and in Pawnee county, also near Sapulpa and the shallow sand field. A few good wells are the greatest rejuvenator known to the petroleum industry.

The French Deal.

The most trustworthy information that drifts across the ocean from Paris, France, is that the negotiations by the so-called French syndicate for the Barnsdall properties in several states is progressing favorably and that the auxiliary deal for over $2,000,000 worth of developed and undeveloped leases in the lower Creek country, at Okmulgee, Muskogee and adjacent territory, is well advanced toward completion. The statement is made that the syndicate has shipped $2,000,000 in cash to the United States in escrow to hold the properties. The cause of the delay, according to the information, is the slowness in perfecting the organization of the purchasing and holding company, made up of bankers, financiers and investors in France, England and Germany. The dropping out of one person or interest necessitates going all over the work again. It is asserted by people who have been engaged in the negotiations for some months that the Dutch Trading Company is the power behind the move, working through local affiliations in several countries. Dr. Hirshi, the geologist and educator, of Zurich, Switzerland, who spent four months last summer investigating the properties included in the Okmulgee and Muskogee deal, has been geological adviser for the Dutch Trading Company and its affiliations, and he recommended the properties that are now under favorable consideration, but reported adversely as to some of the holdings intended to be included in the Barnsdall deal proper. He also selected a large acreage which he took direct to the syndicate at first hands. The information that comes to The Journal is that as soon as the purchase and holding company is organized satisfactorily the verification of all the titles will proceed at once and as soon as completed negotiations will close, as the properties have been favorably passed upon by the advisory examiners and the price agreed upon. This information reaches this side authoritatively enough and is entitled to some credence, with the proviso that the elimination of one or two or more persons needed to complete the organization might eventually defeat the desires and intentions of all the others, in a deal of such magnitude. It can be said at least that no one on this side knows more than is here outlined, or at any rate can guarantee more.

Pipe Line Changes.

M. M. Doan has officially been put in charge of the land and office detail of the Oklahoma division of the Gulf Pipe Line Company and Gypsy Oil Company, succeeding C. C. Barry, who goes to Chicago to take a responsible position with President C. H. Markham, of the Illinois Central railroad, one of the Harriman systems. Murray is abundantly qualified to shoulder the responsibilities of the position, as he possesses a thorough practical knowledge of the work and is deservedly popular with all classes of oil field people. The companies are to be congratulated in having secured such an efficient man. The unexpected death of Leigh Gordon, Texas and Louisiana superintendent of pipe lines, will necessitate the selection by the Gulf Pipe Line Company of a successor, which is not an easy problem.

H. L. W.

FEBRUARY IN OKLAHOMA.

Summary of Operations.

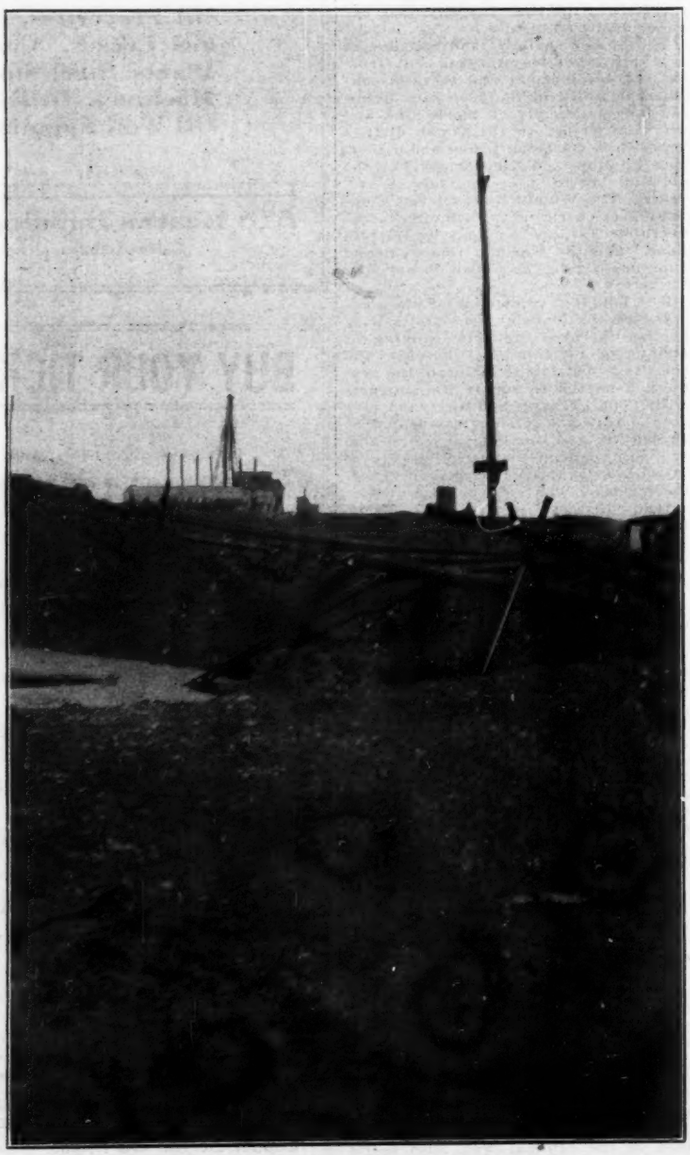
	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Ch'kee D. S.	99	2,785	4	10	8	58	61
Ch'kee S. S.	125	7,213	3	2	..	45	45
Osage	32	8,105	3	..	38	38	76
Cleveland	4	275	..	1	6	8	14
Creek	47	4,365	6	1	33	80	119
Miscel.	..	.....	..	..	3	8	11
Total	307	22,743	16	14	88	232	326
Total Jan.	292	23,300	31	14	51	263	314
Difference	15	553	15	..	37	31	12
Diff.	15	553	15	..	37	31	12

Increase in completed wells, 15.
Decrease new production, 557 bbls.
Decrease in dry holes, 15.
Increase in rigs, 37.
Decrease in drilling wells, 31.
Net increase in new work, 12.
Average of February wells, 82⅝ bbls.
Average of January wells, 94 1-3 bbls.

Kansas February Summary.

County	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Allen	4	10	1	2	..	2	2
Neosho	1	.....	..	1	..	..	..
Wilson	7	.....	2	5	1	3	4
Montgomery	4	20	1	2	1	7	8
Chautauqua	4	60	1	..	..	6	6
Total	20	90	5	10	2	18	20
Total Jan.	29	155	8	14	..	29	29
Difference	9	65	3	4	2	11	9

Decrease in completed wells, 9.
Decrease in new production, 65 bbls.
Decrease in dry holes, 3.
Decrease in gas wells, 4.
Increase in rigs, 2.
Decrease in drilling wells, 11.
Net decrease in new work, 3.
Average of February wells, 18 bbls.
Average of January wells, 21½ bbls.



FLOWING WELL IN VINTON FIELD.
Gulf Refining Company's No. 2, Gardiner-Noble-Gray. Initial production 4,000 bbls.

CADDO MAKES A SPURT.

Several Good Producers Increase Production—Field Notes.

SHREVEPORT, La., Feb. 27.—(Special.)—The completion of several new wells the past week has again tended to raise the spirits of the operators in the Caddo field as well as raising the production substantially. The Standard Oil Company brought in a 700-bbl. well in section 10-20-16, at 2,500 feet, a little east of south of the Producers Oil Company's No. 1 Atlanta in section 3. Nothing has been drilled in the intervening territory and it may be possible that the sand is not broken between the two wells. The Shreveport-Atlanta Oil and Gas Company drilled a test near the south line of its lease in section 10, a little north and east from the Standard's new well. The hole was junked and never completed, although a showing was reported, but the impression prevailed that it was drilled below 2,400 feet. It was afterward learned that it was about 2,100 feet. It was the showing in this test that induced the Producers to secure the lease and drill Atlanta No. 1, almost five years later. The Standard Oil Company has a lot of land under lease near its Stiles-Lewis well, recently completed, and if there should happen to be a southern trend from the Atlanta well it will profit.

The strongest well completed in some time was brought in by the Gulfey Petroleum Company in the Burr pool in Texas. Bruton No. 2, which was showing small last week, got the gas and came in, making at the rate of 3,500 bbls. and is now down to a steady flow of 2,300 bbls. every twenty-four hours, about the same kind of a producer as Burr No. 1, the Gulf's best well, and what now appears to be the steadiest producer in the entire Caddo field. Bruton No. 1 is 1,000 feet northeast of Burr No. 1, is the same gravity and the seventh well drilled in the pool, all producers.

The Koster Oil Company, the Dutch company and the first foreign capital in the field, has completed its first well, a good producer, flowing 700 bbls. The location is in the northwest quarter of the northwest quarter of section 2-20-16 and known as Florsheim No. 2. The hole was dry at 2,386 feet, the depth of the other producers in section 3 adjoining, and was almost given up as a failure by those familiar with the field. The company decided to deepen and went below 2,300 feet and got the oil. This is another illustration of the peculiarities of this field, as the Sun Company, drilling a quarter of a mile southwest, failed to get the sand at the regular depth and went below 2,400 feet, finally abandoning the hole as dry. The Koster well is about the same distance from the Richardson dry hole in the same section, and, like the new well of the Standard, has no other producer in its immediate neighborhood.

The Standard also completed a 100-bbl. well on a one-acre lease, the S. A. Guy, in section 10-21-16, showing a strong gasser at 2,260 feet, with no oil. The oil came in, however, and the company is setting a packer and small string of pipe to make it flow stronger. The Standard has several wells flowing by heads that will have packers set in to make them flow regularly.

Harrell Well Comes Back.

Producers No. 6 Harrell, the well which caused unusual interest two weeks ago, located in section 4-21-16, almost two miles in advance of production, came back Monday, flowing 1,400 bbls., but plugged itself off today and quit flowing. Efforts are being made to get it started again. This is the well which was considered a failure, having struck salt water below the pay depth, and was deepened, without much hope of a producer, to test a deep-sand theory, and which came in making 1,700 bbls. Not much attention was paid to the drilling and when the well came in there was a scramble for lands near it. It is considerably below 2,400 feet, is the deepest producer in the field and has a re-

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ported gravity of 45, although some of the tests make it 43.2.

The Higgins Oil and Fuel Company's good well in section 34-21-16 continues to flow 2,100 bbls. every 24 hours, but it looked for a time like it would be lost, as a well being drilled by the Koster Oil Company offsetting on the east struck a soft formation at 2,221 feet and lost the mud, which showed up in the Higgins well, checking it for a little while and losing half a tank of oil while it was off. The 6-inch has been set in the Koster well and the company is in a quandary what to do, for if more mud is pumped in the hole the Higgins well will be killed and there is no certainty that the Koster company will get a well, so it is shut down for the present.

For the first time in several weeks the production of the field has reached the 20,000-bbl. mark, on this date being placed at 21,000 bbls., not counting the Harrell well, which is temporarily dead. The Gulf Refining Company again takes the lead, having relinquished it for several days to the Standard Oil Company, the Bruton well of the former company giving it the advantage. The Standard has completed a number of wells recently which, while not very big, in the accepted terms of this field, have nevertheless helped to swell the production, while the Gulf has had the most regular production in the field. The Producers Oil Company has been trailing for some time, but it is not so long ago that it had more than all the other operators combined. The 42 tanks of the Louisiana Company at Ardis, with over 1,000,000 bbls. in storage, bear witness to a heavy production.

The Pure Oil Company's test in the northeast quarter of the southeast quarter of section 10-20-16 is a dry hole and abandoned, and another one started. It is below 2,400 feet, a small showing found at 2,260 feet. On account of having struck the pay so high, all the other wells in that locality having gone to 2,280 feet before the oil was found, it was decided to go into it a little deeper, but it was a very thin sand, the drill going into salt water within a few feet, and the chance to make a well at that depth was lost.

The Pure Oil Company has a 25-bbl. well which has been producing since last September. It is located on a mineral file claimed by the Producers Oil Company, which brought suit against L. Hanszen and others, who leased the land. The Producers leased all the land in lot 1, section 4-21-16, and claimed all the high land between the government's traverse line and the water. Judge Bell, of the First district court at Shreveport, decided in favor of the Producers Oil Company this week, and an appeal has been taken.

The suit of Watkins et al. against the Producers Oil Company to recover one-half of a 160-acre tract in section 3-20-16, on which Atlanta No. 1 is located, and also one-half the oil produced by this well, will be heard shortly. Judge Sutherlin, who was to have heard the suit at the last term of court, disqualified himself, and it had to wait until Judge Bell had finished the criminal docket, as the judges alternate between the criminal and the civil.

The Shallow Wells.

Some of the shallow tests drilling at Hosston are about due and should prove the value of this territory. McCann & Harper's big water well is still making 250 bbls. of oil every 24 hours.

Summary of February Operations.

	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Feb.	35	14,635	*8	4	**34	80	114
Jan.	28	8,775	13	..	†42	‡76	118
Diff.	... 7	5,860	5	4	8	4	4

‡Should have been 76 in January report.
*Includes 1 lost hole.
**Includes 2 rigs shut down.
†Includes 1 rig shut down.
Increase in completed wells, 7.
Increase in production, 5,860 bbls.
Decrease in dry holes, 5.
Increase in gas wells, 4.
Decrease in rigs, 8.
Increase in drilling wells, 4.
Net decrease in new work, 4.
Average of February wells, 418 bbls.
Average of January wells, 313 bbls.
(Detailed report March 9.)

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Thirty-five wells were completed in the Caddo field in February, 27 of which were producers, with an initial production of 14,635 bbls., seven were failures and one a lost hole. The January record was 28 completions, of which 15 were producers, with an initial output of 8,775 bbls., and 13 dry holes, the gain in production over January being 5,860 bbls. Eight less dry holes were completed in February than in January and four more gas wells, January reporting no gassers. Eighty wells were reported drilling and 34 rigs up on February 25, compared to 76 drilling wells and 42 rigs up on January 25, a gain of four drilling wells in February and a loss of eight rigs. February leads all other months in drilling wells since the field was opened, there being 80 rigs running, exceeding January, the best previous month. The average per well for February was 418 bbls., while January showed an average of 313 bbls. During the past month several important wells were completed, chief of which was Harrell No. 6, for the Producers Oil Company, located in section 4-21-6, almost two miles in advance of production to the northwest. The well started off at a 1,700-bbl. rate and declined to 1,000 bbls., when water broke in from above and killed it. The impression is that the new pool is similar to all the others in the field, but until more wells are completed nothing definite will be known. The well is considerably deeper than any other producer and is supposed to be a dip in the sand in that direction.

The J. M. Guffey Petroleum Company (Gulf Refining Company) completed a 3,000-bbl. initial producer in the Burr pool in Texas near the state line, and the Higgins Oil and Fuel Company completed its first good well in the Caddo field, a 2,500-bbl. producer in the proven territory. The Koster Oil Company, a Dutch concern, the first foreign capital interested in the field, brought in a 700-bbl. well, its first completion. The company has five other wells drilling.

The 25th of the month saw the production back to 21,000 bbls., the recently completed wells of the Higgins, Koster, Gulf, Producers and Standard companies raising the total. This is a gain of 6,000 bbls. over the previous month, and with a number of wells nearing completion in the established pools it is expected to reach 25,000 bbls. in the next few days. Shallow sand drilling received an impetus in February and Vivian and Hosston will be busy spots for some time to come. The credit balance price of 44 cents for both grades remains the same, the sale by the Vivian Oil Company to the Gulf Refining Company of 20,000 bbls. of heavy oil for 50 cents being the only feature of the market.

CENTRAL-NORTH TEXAS.

Summary of February Operations.

	Comp.	Prod.	Dry	Gas	Rigs	Drg.	Ttl.
Corsicana	12	15	7	..	..	7	7
Petrolia	1	..	1	..	2	8	10
Total	13	15	8	..	2	15	17
T't'l Jan.	6	4	4	..	2	13	15
Difference	7	11	4	..	..	2	2

Increase in completed wells, 7.
Increase in production, 11 bbls.
Increase in dry holes, 4.
Gas wells, none, same.
Increase in drilling wells, 2.
Average of January wells, ¾ bbls.
Average of February wells, 3 bbls.
(Detailed report March 9.)

GULF COAST REGION

DAILY PRODUCTION FOR FEBRUARY.

(Estimated.)

Southeast Texas.

District.	Jan. 25.	Feb. 25.
Saratoga	3,000	3,000
Batson	3,500	3,500
Humble	6,500	6,500
Sour Lake	5,100	4,800
Spindletop	3,500	3,500
Hoskins Mound	.....	.....
Markham	3,750	2,000
Dayton	50	50
Total	25,400	23,350

Louisiana.

District.	Jan. 25.	Feb. 25.
Jennings	4,000	4,000
Vinton	10,000	20,500
Others	*200	200
Total	14,200	24,700

*Includes Anse la Butte and Welsh.

Gulf Coast Region.

District.	Jan. 25.	Feb. 25.
Southeast Texas	25,400	23,350
Louisiana	14,200	24,700
Total	39,600	48,050

The estimated production of the Gulf Coast region was 48,050 bbls. on February 25, an increase of 8,450 bbls. as compared to the figures on January 25. The Texas fields show a decrease of 2,050 bbls. and the Louisiana fields an increase of 10,500 bbls. The Texas decrease is due to a loss at Markham and Sour Lake, the former field losing 1,750 bbls. and the latter 300 bbls., Humble, Batson and Spindletop remaining stationary. Again Vinton gets credit for the gain in the Louisiana fields, showing an increase of 10,500 bbls., Jennings, Anse la Butte and Welsh holding their own. The new wells at Vinton had an initial output of 36,000 bbls. but failed to hold, being credited with 20,500 bbls. on February 25. With no prospects for an increase in any of the old fields, Vinton will have to be looked to to fill fuel contracts in the Gulf Coast country.

VINTON SHOWS GOOD.

Several Good Wells Completed—Production Holds—Notes.

BEAUMONT, Tex., Feb. 25.—(Special.)—Gulf Refining Company's No. 5, Gardiner-Gray-Noble, came in Monday night as the biggest gasser in the field and went on to oil Tuesday morning, flowing 8,000 bbls., and now making 5,000 bbls. It is located 75 feet south of No. 1 and 200 feet north of Vinton Petroleum No. 3.

The Gulf Refining Company added another good well in the Vinton field to its already large production when No. 6 Gardiner-Noble-Gray came in late Friday night, flowing 2,500 bbls. No new territory was proved, as it is located directly between Nos. 2 and 3 on the same lease, both good producers. The new well is the fifth completed on this lease, all producers, the most prolific lease in the field, having made to date approximately 325,000 bbls. of oil.

The lease consists of 40 acres in the northeast quarter of the southeast quarter of section 33-10-12 and was leased by Gardiner & Noble from J. G. Gray, who in turn leased it to the Gulf Refining Company, retaining a half interest with that company. On November 12 the Gulf company completed the first well, which flowed for a week and then sanded up, was put to pumping and is still producing 120 bbls. every day. No. 2 was completed January 7 with an initial output of 2,500 bbls., and is making 1,600 bbls. on this date. January 28 No. 3 was completed, flowing 4,500 bbls.; No. 4 was completed February 7, flowing 4,500 bbls., the present production of the lease, including the new well, being 7,000 bbls., Nos. 4 and 6 making 2,000 bbls. each, No. 3 making 1,400 bbls. and No. 2 making 1,600 bbls. The Gulf company is drilling Nos. 5, 7, 8 and 9, and has rigs up for Nos. 10 and 11. So far the production has been found on the south line of the lease, just north of the producing wells of the Vinton Petroleum Company and the Producers Oil Company, but No. 8, along the west line and 455 feet north of the south line, and No. 9, located north of No. 1 and 235 feet from the south and along the east line, will undoubtedly be producers.

A Failure and Sale.

The Harmony Oil Company's second test, located in the northwest corner of its 10-acre tract in the southwest corner of the southwest quarter of section 34-10-12, 100 feet southeast of the Vinton Petroleum Company's No. 2—one of the best wells in the field—came in a dry gasser, killing the Vinton well. Inasmuch as both of the Harmony tests were failures, the Vinton Petroleum Company offered Underwood Nazro, largely interested in the Harmony Oil Company, $6,000 for the lease and a two-acre tract in the northwest corner of the southwest quarter of the same section. The offer was accepted and the Vinton Petroleum Company took over the property. A gate was put on the gas well and Vinton No. 2 started to flow at the rate of 2,000 bbls., so it is only a matter of six days before the Vinton Company will have received its money back.

On the Pump.

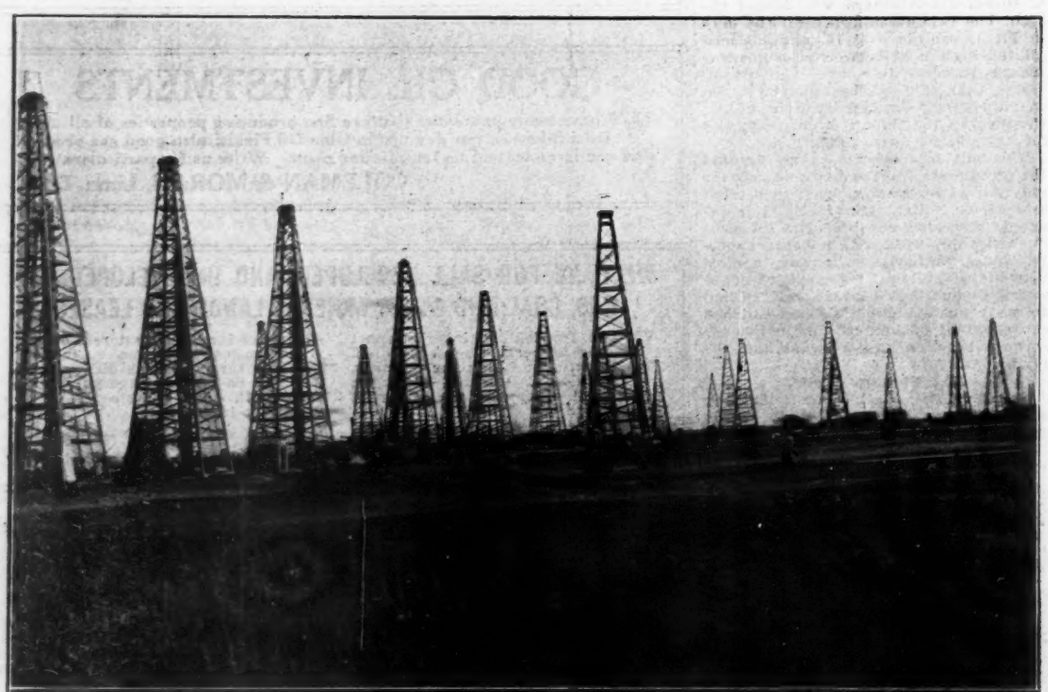
Three of the former gushers are now being pumped, Vincent No. 2, Gulf Refining Company, quitting on the 19th and put to pumping on the 20th, making 200 bbls. The Stewart Oil Company was unable to flow its well and it is pumping 120 bbls., while the Wilson-Tucker well, which has been pumping several weeks at the rate of 160 bbls., has increased to 250 bbls. The Sabine Oil and Mineral Company's No. 1, the discovery well, is pumping 15 bbls., Hooks Oil Company No. 1 is pumping 15 bbls., Sabine No. 2 is pumping 40 bbls., and Vinton Petroleum Company No. 1 is pumping 30 bbls. These four wells are southeast and south of the best producers and never flowed, apparently being on the extreme edge of the pool. The joint well of the Gulf and Producers companies is pumping 60 bbls., having flowed when completed at the rate of 2,000 bbls. for several days. It is on the Vincent lease and marks the eastern edge of the pool.

The Field's Production.

The total production on this date is placed at 20,500 bbls., the Gulf Refining Company leading with 11,000 bbls. from eight wells, the Producers 5,500 bbls. from two wells, the Vinton Petroleum Company 3,500 bbls. from three wells, and the pumpers making up the other 500 bbls. When it is considered that some of these wells have flowed steadily, upward of 2,000 bbls. for nearly two months, and apparently will flow for some time to come, all from a pool defined on every side except one—the farthest producers being only 2,000 feet apart—Vinton must be classed with the other Gulf Coast fields, perhaps not in longevity of wells or amount of oil to be produced, as the present production may pinch out to the west at any time, but in the amount of oil produced since the Gulf Refining Company completed its first gusher December 23.

Rigs and Drilling.

The Gulf Refining Company is drilling seven wells and has three rigs up, the Producers Oil Company is drilling three wells and one rig up, the Vinton Petroleum Company is drilling four wells and two rigs up, the Ninety-Nine Pumping Company is drilling two wells; Wilson & Tucker, the Stewart Oil Company, the Gray Oil Company, Smith & Newman, and the Lake Arthur Oil Company are drilling one well each, and the Hooks Oil Company, McReynolds, Hap. Avery & Co., and the Charley Oil Company have rigs up. The Crowley Oil and Mineral Company has made a location in the southeast corner of a 9-acre tract south of the Gulf-Wilson 10-acre lease in the northeast corner of the southwest quarter of the southeast quarter of section 33-10-12. In all, 21 wells are drilling and 10 rigs are up. The Sabine Oil and Mineral Company has abandoned its test to the southeast, the Gulf Refining Company has temporarily abandoned Sabine-Vincent No.



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1, southeast of production, and Gardiner-Noble-Hooks No. 1, north of production across the productive Gardiner-Noble-Gray 40 acres, and the Hooks Oil Company has abandoned the blowout. Producers Oil Company No. 1 Hooks, north of production, and Vincent No. 2 are shut down, and Gardiner-Noble 1 Gray, a salt-water well 2,000 feet northeast of production, is being deepened. Several wells have set 6-inch and drilled to the sand and before the week is out a number should be completed.

No Change in Market.

No new contracts have been made, all the oil produced at this time being contracted with the exception of a little from the small pumpers run on credit balance at 50 cents. The Vinton Petroleum Company started filling the contract made recently with the Southern Pacific railroad, calling for 500,000 bbls. at 50 cents, drawing on earthern storage. The oil is to be delivered on board cars by the Vinton company, which would make the price 42½ cents at the wells. The Vinton Petroleum Company has the matter of constructing a line under advisement, but it is hardly likely that it will ever be built. The company's lease is only 20 acres and it is doubtful if more than half of it contains oil. The president of the company, C. L. Smith, has a lease north and west of production which may prduce oil that he might turn in on the contract if the 20 acres fail to produce the needed amount, but as the contract calls for 500,000 bbls. regardless of where it is produced, figuring production from wells yet to be drilled is, to say the least, uncertain.

Barging Oil.

The Teche Transportation Company is barging oil for The Texas Company to its refinery, the Jennie Barbour and two tugs loading at Big Eddy on the Sabine river. Eighteen thousand bbls. can be handled in this way every day, although the daily shipments do not near reach that amount.

Other Louisiana Fields.

No completions at Jennings, Anse la Butte or Welsh during the week. In the former field the Crowley Oil and Mineral Company is drilling a well and has a rig up at Egan, and Barden & Rye have a rig up on the Leckelt lease. The Rowson Oil Company is drilling No. 4 Begnaud at Anse la Butte and no wells are drilling or rigs up at Welsh.

THE TEXAS FIELDS.

Spindletop.

The Guffey Company completed No. 135 Gladys, a 90-bbl. pumper, in the portion of the field known as the flats, close to the flowing well of the Right-of-Way Oil Company. Philp Brothers' No. 17 Higgins is bailing, showing for a small well. L. D. Thresher No. 3 McFaddin, a small well, sanded up and is being washed. Claude Derr is drilling his No. 3 Kieth-Ward deeper, Stollenwerck is trying to pull a strainer in his No. 7, the Sun Company is sidetracking a strainer in No. 8 Star & Crescent and has a rig up for No. 41 McFaddin, Unity No. 2 Gladys, Dornak & Powell No. 1 Bowles, Hunter and others No. 3 Weed, and Wilson & Broach No. 24 Heywood are drilling, and Shingler, Baldwin & Flynn's No. 3 Yellow Pine and Guffey No. 134 Gladys are rigs. The Right-of-Way Oil Company's No. 3 is still flowing at the rate of 600 bbls. every day, by heads twice an hour and from three to five minutes a flow.

Saratoga.

The Producers Oil Company is still working on No. 5 Nancy Fuller, a deep test that proved a failure. The hole was drilled to 2,200 feet, was put on air with no success and is now being perforated in the shallow sand. This is the only well drilling in the field. The Sun Company has a rig up for No. 51 Williams, and the Rio Bravo Oil Company is planning to do some drilling in the near future.

Batson.

The Sun Company's No. 43 Milhome, a 30-bbl. well, was the only completion for the week, No. 44 a rig, Par-

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affine No. 2 Colorado-Syndicate and E. G. Christian No. 2 Milhome are drilling and Christian Oil Company No. 28 Milhome is a derrick.

Sour Lake.

C. Y. T. Oil Company No. 1 Heywood was completed, pumping 10 bbls., Texas Company No. 166 fee, pumping 25 bbls., Gilbert No. 47 fee, a 50-bbl. well, and Gilbert No. 8 Hardin county, a dry hole, were the completions for the week. Texas Company No. 168 is bailing, and No. 169 is a rig. Sun No. 30 Brown, P. Teighe No. 1 Producers, F. E. Heidner No. 11, Lucy Moore No. 7, Crosbie No. 7, and A. H. Tarver No. 6, and Hardin Oil Company No. 20 are drilling; Gilbert No. 9 and C. Y. T. No. 2 are rigs.

Humble.

Sun No. 98 Long, a dry hole, was the only completion for the week, but a number of shallow wells are due. Outside of the tests being drilled in the deep territory to the east of the field practically all the work is in the shallow territory, about 950 feet deep. The Sun Company made a test in its deep well on the River lease, got salt water and is drilling deeper.

Markham.

No wells have been completed in this field since last report and the production has fallen off, Hardy No. 28 the latest, having quit flowing and will be pumped. The cold weather has also affected the pumping wells by making it difficult to keep steam. Pay Streak No. 5 has had trouble in setting a strainer, Producers No. 1 Smith is below 1,800 feet with no showing, Burke No. 3 has had some trouble in seating 6-inch casing, and the Square Deal dropped a string of tubing and a working-barrel has been lost in the hole.

Goose Creek.

The Producers Oil Company is below 2,000 feet in its test and it is likely the hole will be abandoned, and the company will quit the field. Patillo Higgins is below 1,600 feet in his second test and seems to have missed the sand found in his first well, now pumping 20 bbls.

Wildcat Notes.

D. M. Watson is drilling at 1,575 feet in his test near the iron bridge, four miles west of Beaumont.

The Edgerly Oil Syndicate is getting ready to drill a test near Edgerly, La., 6 miles northeast of the Vinton field. Several tests have been drilled and while oil was found the salt water could not be cased off.

The Millville Oil Company is drilling a test at Henderson, Texas.

John Davis and others, while drilling near Votaw, Texas, 12 miles from Saratoga, got a showing of oil and gas between 700 and 900 feet. The showing caused some excitement, the crew being affected so they left the rig to report the showing, and shut off the pumps, with the result that when they returned the hole had caved. Several of the large companies have taken land near the well and additional tests may be made.

P. M. Granberry recently completed a 2-bbl. well on a 320-acre lease on the Blount-Morrison tract at Nacogdoches, Texas. Tests have been drilled at this place, but were never made to pay. The oil was found at 300 feet and Mr. Granberry believes he can drill a number of small wells that can be operated by a power with profit.

The test being drilled by the Spider Oil Company at Spider, La., near Mansfield, is causing a good deal of interest to be shown by the companies operating in the Caddo field and by individuals from various parts of the country. The hole is in the neighborhood of 1,500 feet deep and claims are made that it is regular with the Caddo formations. Three tests were drilled several years ago and showed some oil and gas, one well producing a little oil and water until the casing was pulled recently by the Spider Oil Company. Land for miles around has been leased and if this test proves a success it won't be long until the surrounding territory will resemble the activity at Caddo.

A press dispatch from Courtney, Tex., states that the Waller County Oil Company, of Hempstead, which has been drilling near Courtney, has pulled the pipe after drilling 2,000 feet, and will drill another test about two miles from the abandoned well.

The L. E. & W. Oil and Gas Company, a Lima, O., organization, made up of employes of the L. E. & W. railroad, has purchased a drilling outfit and will at once start operations on its lease in Dallas county, Texas. S. B. Ridenour will be in charge of the drilling.

Summary of February Operations.

District	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Spindletop	8	1,160	1	3	8	11
Saratoga	1	70	..	1	1	2
Batson	2	50	..	2	3	5
Sour Lake	12	335	3	3	8	11
Humble	20	955	7	6	14	20
Markham	3	3,300	1	1	9	10
Goose Creek	..	.....	..	..	2	2
Vinton	19	36,240	9	9	22	31
AnselaButte	..	.....	..	..	1	1
Jennings	..	.....	..	1	1	2
Welsh	1	.....	1	..	..	..
Total	66	42,110	22	26*	69	95
T't'l, Jan.	48	22,470	17	25**	73	98
Difference	18	9,640	5	1	4	3

*Includes 3 wells reported as shut down.
**Includes 7 wells reported as shut down.
Increase in completed wells, 18.
Increase in production, 9,640 bbls.
Increase in dry holes, 5.
Increase in rigs, 1.
Decrease in drilling wells, 4.
Net decrease in new work, 3.
Average February wells, 638 bbls.
Average January wells, 676 bbls.

Sixty-six wells were completed in February in the Gulf Coast region, of which 44 were producers, with a total initial output of 42,110 bbls., compared to 48 completions in January, 31 of which were producers with a total of 32,470 bbls., a gain of 9,640 bbls. for the month. Twenty-two dry holes were completed and 17 in January, an increase of five. Twenty-six rigs were up on February 25, compared to 25 on January 25. A total of 69 drilling wells were reported on February 25, while January 25 showed 73, a loss of four for February, leaving a total net decrease in new work for February of four. The average per well for February was 638 bbls., the January average being 676 bbls.

The total new production of 42,110 bbls. is the largest in several years and is due almost wholly to the new field at Vinton, La., which furnished 36,240 bbls. of the total. This field has had a spectacular rise, gaining 10,000 bbls. over January and nearly 30,000 bbls. since December. Nineteen wells were completed, of which 10 were dry holes, none of which are in the pool but in what is now known as dry territory. Since the main pool has been found only one well has been less than a 2,000-bbl. producer, and that on account of not being properly finished, the high mark being reached with a 10,000-bbl. gusher. Twenty-two rigs are running, at least 10 of which are nearing completion, and the production should materially increase within the next few days.

Markham reported two new wells, with 3,300 bbls., but failed to hold it long. Spindletop had 1,160 bbls. of new oil, a flowing well with 750 bbls. helping that field. Humble reported 955 bbls. for the month, Sour Lake had 335 bbls., Saratoga 70 bbls., Batson 50 bbls., Goose Creek, Anse la Butte, Jennings and Welsh adding nothing to production.

Credit balance prices are the same as reported last month, with no change in sight in the very near future unless Vinton drops off or the field is extended a considerable distance to the west, there being nothing in any of the old fields to influence the market. A credit balance price of 50 cents is posted at Vinton, but contracts have been made as low as 35 cents and none over 50 cents. The Vinton Petroleum Company made a contract with the Southern Pacific railroad to deliver 500,000 bbls. at 50 cents, the largest contract to date in the field.

A. V. B.

RAILROAD CONSUMPTION OF OIL.

Increased Use in 1910 and More Roads Interesting Statistics.

It will be seen from the following tables that the use of fuel oil by the railroads of the United States is on the increase, the consumption in 1909 amounting to 19,939,394 bbls., as compared with 16,889,070 bbls., an increase of 3,050,324 bbls., or 18 per cent, in 1908, and with 18,855,691 bbls. in 1907. The consumption of oil per mile of road operated was 3,66 bbls. in 1909, as compared with 3.81 bbls. in 1908 and with 3.93 bbls. in 1907, which shows that more economic methods are now employed than were in use when oil was introduced as a fuel by the railroads of the country. Most of the oil consumed on the railroads is crude oil, but a considerable quantity of residuum also is used, this being the product left after the lighter oils have been extracted by refining.

The exact data gathered by the government has not yet been issued for 1910, but The Journal has secured considerable data itself, as it always does, from the territory traversed by the majority of oil-burning railroads, which shows that there was an increase in consumption during 1910 over 1909 of nearly 3,000,000 bbls., in California, Texas, Louisiana, Oklahoma, Kansas and Missouri, with at least three roads in Pacific coast Canada beginning the use of liquid fuel. In 1909 the total consumption of oil by railroads was 19,939,394 bbls., while in 1910 the total increase to at least 22,000,000, if not 23,000,000 bbls.

The railroads that used liquid fuel in 1909, as ascertained by the United States Geological Survey, are as follows: The Sunset system of California, Texas and Louisiana (embracing the Southern Pacific Company (Pacific and Atlantic system), the Oregon Short Line Railroad Company, the Galveston, Harrisburg and San Antonio Railway Company, the Texas and New Orleans Railroad Company, the Houston and

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Front Row, Left to Right—M. R. Patterson, H. A. Beasly, Jno. A. Bell, Jr., H. H. Wrightsman, E. M. Shugert, Jas. Wykoff. Second Row—Jno. DeHart, E. L. Kraer, Ben Gessel, J. A. Sivalls, Roy Aggers. Third Row—O. A. Kraer, Dick Hoskins, Waite Phillips, H. F. Raeder, W. H. Gettinger. Fourth Row—A. Lewis, F. R. Stevie.

Texas Central Railroad Company, the Houston, East and West Texas Railway Company, the Houston and Shreveport Railroad Company and the Louisiana and Western Railroad Company); the Frisco lines (including the St. Louis and San Francisco Railroad Company in Missouri, Kansas, Texas and Oklahoma, and the Chicago, Rock Island and Pacific Railway Company in Kansas and Oklahoma); the Atchison, Topeka and Santa Fe Railway Company in California, Arizona, New Mexico, Kansas, Oklahoma and Texas; the Kansas City Southern Railway Company, in Missouri, Kansas, Texas and Louisiana; the International and Great Northern Railroad Company, in Texas; the San Pedro, Los Angeles and Salt Lake Railroad Company; the St. Louis, Brownsville and Mexico Railway Company, in Texas; the Trinity and Brazos Valley Railway Company, in Texas; the Galveston, Houston and Henderson Railroad Company, in Texas; the San Antonio and Aransas Pass Railway Company, in Texas; the Texas and Pacific Railway Company, in Texas, and the Chicago and Northwestern Railway Company, in Wyoming.

To this list must be added the Great Northern, the Northern Pacific and the Canadian Pacific railroads, which made contracts in January with the Agency in California to furnish oil for three years. In the later part of 1910 the Santa Fe railroad began the use of oil on its Kansas divisions. The New York, New Haven and Hartford railroad is now making trials preliminary to beginning the use of oil in New England, and it is not improbable that the Illinois Central system will soon begin its use.

In Texas the Southern Pacific lines, the Gulf, Colorado and Santa Fe (a Santa Fe line), Kansas City Southern, San Antonio and Aransas Pass, International and Great Northern, St. Louis, Brownsville and Maxico, Trinity and Brazos Valley (a Frisco line), Galveston, Houston and Henderson, Gulf and Interstate, Texas and Pacific, Houston Belt and Terminal roads and the Galveston Wharf and Terminal Company are all heavy consumers of fuel oil, and in 1909 their total consumption was 6,023,288 bbls. In 1910 the same lines consumed 7,042,311 bbls., an increase of a million barrels. The Southern Pacific lines used 6,000 bbls. a day in 1909 and by the close of 1910 they had increased to about 7,000 bbls. a day, the total consumption of that system in 1910 being 2,579,197 bbls., of which its Texas lines used 2,179,940 bbls. and the Louisiana lines 309,257 bbls., all lines showing a steady increase during the last five months of the year. The Kansas City Southern increased from 665,000 bbls. in 1909 to 823,310 bbls. in 1910. The San Antonio and Aransas Pass increased from 480,000 bbls. in 1909 to 550,000 bbls. in 1910. The St. Louis, Brownsville and Mexico increased from 145,000 bbls. in 1909 to 263,072 bbls. in 1910. The Trinity and Brazos Valley increased from 145,000 bbls. in 1909 to 285,000 bbls. in 1910. The Galveston Wharf and Terminal Company used 36,000 bbls. in 1909, but in 1910 it used only 17,732 bbls. Every road from which The Journal has received reports indicates increased consumption, the increase in some instances lessened by the inability of the roads to contract for as much as they would like to.

In California railroad consumption of crude and residuum, mostly crude, averaged 35,000 bbls. a day, a total for 1910 of 12,775,000 bbls., with a steady increase. In 1909 the total consumption by railroads in Texas and Louisiana averaged 16,502 bbls. a day, in 1910 it averaged 19,294 bbls. a day.

Very considerable development in the size of oil-burning locomotives has been attempted. An oil-burning locomotive weighing 300 tons has been built for the Southern Pacific Company for hauling freight over the Sierras between Sacramento and Reno, Nev. The necessity for oil burners in such monster constructions is evident, since the stoking requirements with coal exceed the powers of any fireman.

Consumption of fuel oil by the railroads of the United States, 1906-1909:

Year.	Length of line operated by use of fuel oil.* Miles.	Quantity of fuel oil consumed by railroads. Barrels.
1906.....	.....	15,577,677
1907.....	13,573	†18,855,002
1908.....	15,474	‡16,889,070
1909.....	17,676	‡19,939,394

*Some of these lines also used coal.
†Includes 5,199 bbls. used for shop purposes.
‡Includes 18,188 bbls. used for shop purposes.
‡Includes 34,059 bbls. used for firing engines and for shop boilers.

Year	Total mileage made by oil-burning engines. Miles.	Consumption of fuel oil per mile. Barrels.
1907.....	74,079,726	3,93
1908.....	64,279,509	3.81
1909.....	72,918,118	3,66

ARTESIAN WELLS IN OKLAHOMA.

The Oklahoma legislature has passed a bill which carries an appropriation of $45,000 to drill artesian wells in Beaver, Texas and Cimarron counties, located in the northwest corner of the state. The legislature has hopes that the bill introduced in the United States senate by Senator Gore for a similar appropriation of $100,000 will pass, but, anticipating delay, proceeded to make this appropriation on its own account. A flow of artesian water has already been developed in the adjoining county of Woodward and the enterprise will now be pushed to completion, in the belief that a large section can be irrigated. The drilling contractors of the state will soon be asked to submit bids for this work, which will be under the direction of the State Board of Agriculture.

Work was started on a test well at Ten Mile, six miles east of Normangee, Tex., by a recently organized $10,000 company. D. C. Cole is president, and J. D. Cowden general manager.

Waco, Tex., citizens have petitioned for a public gas-meter tester, and the matter is being considered by Light Commissioner J. F. Wright.

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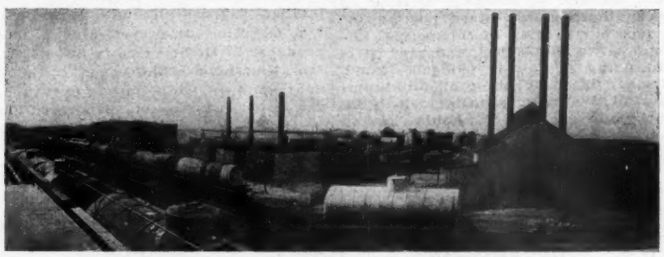
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Operations East of Mississippi, 1910

FOUR STATES OPERATIONS, 1910.

	Comp.	Oil	Dry	Gas	Abd.
January	162	128	24	10	108
February	228	172	46	10	127
March	191	153	31	7	393
April	241	185	43	13	288
May	285	226	47	12	278
June	324	254	61	9	272
July	286	222	57	7	272
August	351	284	57	10	238
September	332	266	59	7	431
October	279	233	42	4	212
November	290	227	58	5	326
December	238	185	41	12	334
Total	3,207	2,535	566	106	3,279

By States.

States—	Comp.	Oil	Prod.	Dry	Gas	Abd.
N.-W. Ohio	572	501	6,745	57	14	1,500
Indiana	365	283	8,665	66	16	1,695
Kentucky	121	70	828	50	1	....
Illinois	2,149	1,681	93,256	393	75	84
Total	3,207	2,535	105,494	566	106	3,279

During 1910 the central western fields of Northwestern Ohio—Lima—Indiana Illinois and Kentucky were not active except Illinois, which showed a large amount of development work within defined limits, especially in the newer and richer southern counties. Had it not been for Illinois the year would have been extremely discouraging from a producing viewpoint, as but few wells out of the ordinary were completed in Ohio, Indiana and Kentucky. As a matter of fact, more wells were abandoned in the Lima-Indiana fields than were drilled, bringing about abnormal conditions of 1910 closing with 72 fewer wells producing than were drilled in the entire region. To be exact, 3,207 wells were completed in the four fields and 3,279 old wells were abondoned. This means, in an oil field, what depopulations means to a town or county, and is not a pleasant commentary.

Of the total completions in 1910, 566 were dry and 106 were gas wells, leaving 2,535 producing oil wells, one-fifth unproductive, the new production as compiled each month totaling for the year 109,494 bbls. a day. The entire daily production of the four fields will not average more than 120,000 bbls. on any specific date, the new wells not being strong enough to keep the average production from declining.

Completion and production tables are given for each field in proper place, but Northwestern Ohio, Northern and Eastern Indiana and Kentucky appear to be just holding on from force of habit, with no new territory being opened that promises much. The old Trenton Rock areas might produce a little more oil, but the failure of the gas pressure—the economical pumping medium—has caused hundreds of light pumping wells to be abandoned, with consequent loss of their small output, and the new wells, relieved of the pressure, soon dwindle in profits. Limited areas will be exploited by local producers for some time to come, with an occasional small pool or a little gas, but men and money from other States are not looking for that kind of production. In Kentucky the old development does not respond very profitably, and the production is steadily declining, forcing the local operators to hunt for something new, which they are doing with deserving optimism. Nearly all the western counties are being leased and prospected, from the Illinois line on the north to the Tennessee line on the south, trying to find new pools, with nothing, no matter how light, barred. The tables speak for themselves.

ILLINOIS DEVELOPMENT.

While 1910 was an active year in Illinois and the total production of the State was increased 2,000,000 bbls., there was drilled 1,002 fewer wells than during 1909, when 95 more dry holes and five more gassers permitted the 1910 production to be increased about 4,000 bbls. a day. Lawrence county developed some strong gushers in the first half of last year that offset the decline in the intermediate sand territory in Crawford county, although nearly twice as many wells were completed in Crawford in 1910 as in any other county. In 1908 Crawford county could show nearly 100,000 bbls. a day, but would be pushed to show 30,000 bbls. now. Lawrence county, with its 50,000 or more a day, is the strength of Illinois, and its five overlapping sands and occasional gushers.

A careful survey of the producing area in the eastern part of the State shows that in the counties of Cumberland, Coles, Clarke and Crawford the locations have been so thoroughly drilled that the drilling of other wells would not be profitable, and, while the dullness is charged against the winter season, there is not likely to be much activity in those districts with the advent of good weather, because the drainage is getting all the oil fast enough—too fast in some instances. Wells showing oil and gas have been drilled in Marion, Bond, Hancock and Jasper counties, and there is a little production in Edgar, Randolph, Madison and Jersey counties, but in inconsiderable quantities, eliminating the Sandoval pool in Marion county, in the western part of the State, which is the best production outside of the five eastern counties that are rated as real producers.

During the year there was an unusual amount of prospect drilling in the southern and western portions of Illinois, but nothing of commercial importance was developed, and very little wildcatting is now in evidence, Bond, Marion, Clinton, Washington, Montgomery and Jefferson counties, all lying contiguous east of St. Louis, having been in some instances disastrously discouraging to the enthusiasts and they are backing up.

ILLINOIS OPERATIONS, 1910.

Month—	Comp.	Prod.	Dry	Gas	Abd.
January	111	5,331	9	8	0
February	158	6,840	36	7	5
March	128	5,593	24	6	3
April	157	7,260	31	10	10
May	192	8,091	35	8	6
June	211	9,267	44	6	14
July	172	6,386	37	6	17
August	245	10,042	40	7	2
September	231	8,419	42	6	7
October	198	10,133	25	1	7
November	177	8,832	35	3	8
December	166	7,062	39	8	5
Total	2,149	93,256	393	75	84

By Counties.

County—	Comp.	Oil	Dry	Gas	Abd.
Clarke	112	80	28	4	23
Cumberland	17	13	2	2	..
Coles	5	4	1	..	1
Crawford	1,210	950	214	46	46
Lawrence	689	594	79	16	14
Marion	60	34	26	..	..
Edgar	2	..	1	1	..
Macoupin	2	..	2	..	..
Morgan	8	..	3	5	..
Green	1	..	1	..	..
Bond	7	1	5	1	..
Hancock	1	1	..	..	..
Union	1	..	1	..	..
Jersey	1	..	1	..	..
Madison	1	..	1	..	..
Wayne	1	..	1	..	..
Jefferson	3	..	3	..	..
Jasper	8	4	4	..	..
Montgomery	2	..	2	..	..
Gallatin	5	..	5	..	..
Jackson	2	..	2	..	..
Champaign	1	..	1	..	..
Clinton	3	..	3	..	..
Saline	1	..	1	..	..
Wabash	1	..	1	..	..
Monroe	1	..	1	..	..
Fayette	2	..	2	..	..
Richland	1	..	1	..	..
Williamson	1	..	1	..	..
Total	2,149	1,681	393	75	84

INDIANA OPERATIONS, 1910.

The Oakland City development in Pike county, southwestern corner of the State, was all that saved Indiana during the year, 215 of the 365—one a day—wells drilled in the entire State being in that soft-sand district contiguous to Illinois. The best well of the year was in Delaware county, a 250-bbl. Hoosier gusher. A little wildcatting is going on, but the business is slipping in Indiana.

Completion Report.

Month—	Comp.	Prod.	Dry	Gas	Abd.
January	18	488	2	2	61
February	33	886	4	2	66
March	29	820	3	1	221
April	27	714	4	1	140
May	25	746	4	1	157
June	38	1,745	2	2	146
July	38	676	3	1	176
August	41	1,159	6	3	126
September	35	400	7	..	294
October	26	480	4	1	80
November	35	290	16	1	100
December	20	261	6	1	128
Total	365	8,665	66	16	1,695

By Counties.

County—	Comp.	Oil	Dry	Gas	Abd.
Wells	33	32	..	1	515
Blackford	7	5	2	..	112
Jay	34	21	10	3	24
Adams	13	12	1	..	57
Grant	2	1	1	..	673
Huntington	3	3	..	..	55
Delaware	9	8	..	1	218
Randolph	20	13	7	..	22
Gibson	9	2	7	..	..
Sullivan	3	3	..	..	..
Dubois	5	1	4	..	..
Martin	2	1	1	..	..
Pike	215	179	25	11	..
Warrick	3	..	3	..	..
Knox	4	1	3	..	..
Spencer	1	..	1	..	..
Vigo	1	..	1	..	..
Daviess	1	1	..	..	..
Wabash	..	..	..	..	2
Madison	..	..	..	..	17
Total	365	283	66	16	1,695

LIMA OPERATIONS, 1910.

One 900-bbl. gusher and several 250 and 200-bbl. spouters were all that relieved the monotony in the Lima fields during the year. A new pool, within old limits, was found in Auglaize county, and in Hardin and Champaign counties, east of the old Trenton Rock formation, about 65 miles west of Columbus, several oil and gas wells attracted some attention, also a small producer in Medina county, in the Clinton lime and connecting with the Southeastern Ohio development, and the good gas wells discovered late in the year.

Completion Report.

Month—	Comp.	Prod.	Dry	Gas	Abd.
January	29	377	5	..	47
February	27	425	2	1	56
March	31	500	4	1	169
April	46	530	4	2	138
May	55	565	6	3	115
June	57	447	6	1	112
July	59	684	7	..	79
August	56	735	5	..	110
September	54	794	5	1	130
October	44	441	4	2	125
November	69	723	5	1	218
December	45	524	4	2	201
Total	572	6,745	57	14	1,500

By Counties.

County—	Comp.	Oil	Dry	Gas	Abd.
Wood	217	189	26	2	571
Hancock	125	114	8	3	315
Allen	13	12	1	..	159
Auglaize	22	17	5	..	80
Sandusky	71	64	5	2	136
Mercer	5	4	1	..	26
Van Wert	20	18	2	..	56
Seneca	54	47	7	..	16
Wyandot	5	3	1	1	45
Lucas	7	7	..	..	57
Ottawa	25	23	1	1	17
Putnam	1	1	..	..	14
Ashland	2	..	..	2	..
Hardin	5	2	..	3	..
Shelby	..	..	..	..	4
Darke	..	..	..	..	4
Total	572	501	57	14	1,500

KENTUCKY OPERATIONS, 1910.

Of the 121 wells completed in Kentucky in 1910, 99 of them were in Wayne county, the principal producing area, with 61 producers and 38 failures. No pipe line outlet operates against active development in the Kentucky rough country. The talent is playing the Illinois and Western Indiana sand to extend through the western part of the State and the Clinton lime formation to keep on down from Central Ohio into Northern and Central Kentucky, and much leasing and an occasional test result.

Completion Report.

	Comp.	Prod.	Dry	Gas
January	4	15	3	..
February	10	110	4	..
March	3	50	..	..
April	11	72	4	..
May	13	149	2	..
June	18	97	9	..
July	17	69	10	..
August	9	60	6	..
September	9	33	5	..
October	11	54	5	..
November	9	81	1	..
December	7	38	1	1
Total	121	828	50	1

By Counties.

County—	Comp.	Oil	Dry	Gas
Wayne	99	61	38	..
Wolfe	4	..	4	..
Lawrence	6	2	4	..
Logan	8	7	1	..
Meade	1	..	1	..
Johnson	1	..	1	..
Carter	1	..	1	..
Menifee	1	..	..	1
Total	121	70	50	1

NEW YORK.

The production of oil in New York is confined to Allegany county, along the Pennsylvania line, one of the oldest producing areas in the United States. During 1910 there was very little change in conditions from 1909, although the production is now computed by gallons per well instead of barrels. In 1910 283 wells were completed, of which number 13 were dry and 51 were gassers, and the new production was 368 bbls., an average of

PENNSYLVANIA.

In 1910 field work in Pennsylvania dropped off nearly half from 1909, caused largely by the heavy decline in price of crude, from $1.78 to $1.30, producers not caring to drill for light wells at that price. One well during the year, in Greene county, started off at 900 bbls. and caused a temporary break in the monotony. There is little to choose between the principal pro-

OIL MEN AND FRIENDS AT MUSKOGEE, OKLA.

Front Row, left to right—Geo. W. Barnes, Jr., Chas. A. Lockard, H. P. Bowser, A. W. Leonard, D. C. Stewart. Rear Row—J. L. Havice, H. King, S. M. Briscoe, Col. C. V. Pyle, Jno. J. O'Day; also three pickanninies.

ducing districts. Below will be found a summary of operations during the year:

	Completed	Prod., bbls.	Gas	Dry
January	147	572	10	23
February	132	320	18	20
March	109	211	10	17
April	190	584	9	26
May	266	1,355	21	32
June	250	621	19	39
July	222	580	27	25
August	211	924	22	31
September	179	353	23	16
October	182	395	25	21
November	188	448	25	22
December	115	296	25	17
Total	2,191	6,659	234	289

WEST VIRGINIA.

West Virginia maintained its production throughout 1910, with a slight increase, but drilling operations are less than formerly, partly because new producing territory was not found, not a single new pool having been opened during the year, and partly because the low price of crude did not seem to justify expensive drilling in light producing territory. In 1910 1,616 wells were completed, 280 of them dry and 434 of them gassers, the new production amounting to 24,366 bbls., which is a good showing compared with 1909 and some previous years. The big gas companies are active developers and lead the way in wildcatting and prospecting for new territory. The following table shows the year's operations:

	Completed	Prod., bbls.	Gas	Dry
January	146	4,413	35	11
February	123	2,059	22	20
March	122	1,992	27	22
April	146	2,089	42	33
May	153	1,985	38	25
June	157	2,533	43	25
July	148	1,702	43	25
August	129	1,500	32	32
September	137	2,643	35	23
October	132	1,442	39	23
November	108	1,410	36	16
December	115	598	42	25
Total	1,616	24,366	434	280

SOUTHEASTERN OHIO.

The high grade districts in Southeastern Ohio made a fair showing during 1910, although 1909 was the banner year in Perry and Fairfield counties, when new companies were numerous. The failure to extend the producing area gradually forced many operators out of active development and the activity in drilling farther west and north for gas somewhat changed the base of operations. The old producing counties along the river are identical with the adjoining West Virginia development and had the same experience. It may be said that the original Southeastern Ohio producing territory has been carried so far toward the central part of the state and been merged with natural gas development that it seems to have lost something of its identity to the early operators, and is further about to form some kind of a connection with the Trenton Rock fields of Northwestern Ohio, apparently. Central Ohio is now the scene and center of considerable excitement and much activity, mostly gas, of course, but with just enough oil showing to start the prospectors going. The following table gives the year's operations:

	Completed	Prod., bbls.	Gas	Dry
January	105	1,312	5	38
February	104	1,440	7	26
March	142	2,278	6	42
April	143	2,647	6	51
May	143	2,292	9	45
June	175	2,035	8	58
July	150	1,296	8	46
August	120	872	3	41
September	121	1,046	4	33
October	97	1,006	7	36
November	97	775	4	24
December	92	637	9	28
Totals	1,489	17,626	76	468

CANADA IN 1910.

The Canadian oil fields have declined to a rather uninteresting stage and natural gas is supplanting petroleum for investment and development. In 1910 the total production of the Canadian fields amounted to only 307,533 bbls., compared to 573,632 bbls. in 1909. The following tables show the production by districts each month, also the amount paid out by the government for bounties:

By Districts

1910.	Dutton, bbls.	Leamington (Inc. Staples, Comber and Blythes-wood), bbls.	Richardson Chatham (Inc. Blakely), bbls.	Thamesville, bbls.	Moore township, bbls.
Jan.	789	....	....	....	1,382
Feb.	637	141	279	....	964
March	595	106	141	....	1,409
April	842	....	279	....	1,658
May	599	....	....	141	1,370
June	488	....	373	....	1,573
July	876	....	144	....	1,284
Aug.	847	....	281	....	1,388
Sept.	598	....	....	....	1,190
Oct.	597	....	144	....	1,029
Nov.	741	....	143	....	941
Dec.	245	....	....	....	420
Totals	7,860	248	1,688	141	14,613
1909	12,267	18,117	2,882	852	25,666

1910.	Oil Springs, bbls.	Bothwell, bbls.	East Tilbury and Raleigh,* bbls.	Onondaga Canaofield), bbls.	Petrolia,† bbls.
Jan.	4,720	2,707	6,387	....	9,972
Feb.	3,761	2,812	5,963	....	6,984
Mch.	3,792	3,467	6,730	....	11,280
April	4,382	2,658	5,103	....	12,249
May	4,067	3,085	4,767	....	12,278
June	4,657	3,252	5,435	....	13,018
July	4,351	1,786	4,103	....	10,993
Aug.	5,408	2,648	4,759	....	11,956
Sept.	4,826	3,693	4,776	132	10,895
Oct.	5,761	3,262	3,438	395	11,019
Nov.	4,709	3,146	4,405	260	10,585
Dec.	5,068	3,094	4,544	281	8,138
Totals	55,507	36,615	60,415	1,069	129,372
1909	61,251	39,820	170,588	....	171,019

*Includes Pardo's Siding and Sandison.
†Includes all districts not enumerated.
Total year's production, all districts, 307,533.

W. J. Harvey, collector of bounties at Petrolia, reports that in 1910 bounties were paid on the following quantities from the fields mentioned:

	Bbls.
Lampton	205,409
Tilbury	63,057
Bothwell	3,698
Dutton	7,751
Onondaga	1,005
Leamington	141
Total	314,363

TOTAL STOCKS PENNSYLVANIA OIL.

1869	340,000
1870	544,626
1871	532,000
1872	1,084,423
1873	1,625,157
1874	1,705,639
1875	3,550,200
1876	2,824,739
1877	3,127,837
1878	4,615,300
1879	8,552,250
1880	17,145,104
1881	25,761,051
1882	34,335,144
1883	35,715,565
1884	36,872,892
1885	33,539,038
1886	33,367,898
1887	28,357,112
1888	18,604,474
1889	10,904,793
1890	9,295,514
1891	15,343,233
1892	17,395,389
1893	12,111,183
1894	6,336,777
1895	5,161,905
1896	9,550,583
1897	10,789,652
1898	11,541,753
1899	13,163,819
1900	13,174,716
1901	9,420,420
1902	5,699,127
1903	4,823,199
1904	6,355,512
1905	3,503,398
1906	4,937,392
1907	5,951,784
1908	3,306,893
1909	5,384,904
1910	4,541,385

TOTAL STOCKS OHIO-INDIANA OIL.

1886	650,000
1887	4,148,465
1888	9,810,714
1889	14,106,149
1890	20,153,256
1891	22,103,705
1892	18,604,442
1893	13,497,340
1894	20,158,266
1895	21,494,848
1896	23,302,770
1897	22,730,498
1898	15,180,892
1899	10,545,927
1900	14,988,928
1901	17,760,306
1902	17,306,426
1903	15,138,637
1904	14,856,398
1905	12,600,960
1906	4,824,435
1907	4,999,553
1908	6,206,504
1909	6,153,526
1910	6,098,413

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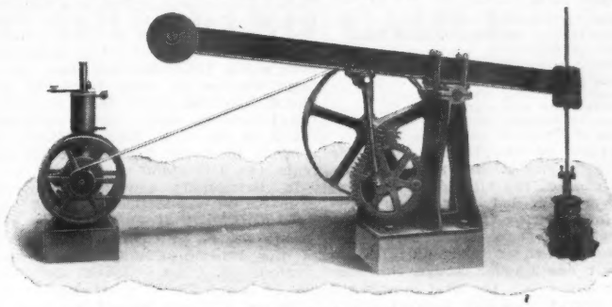

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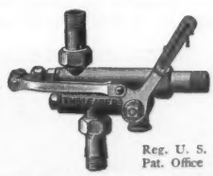

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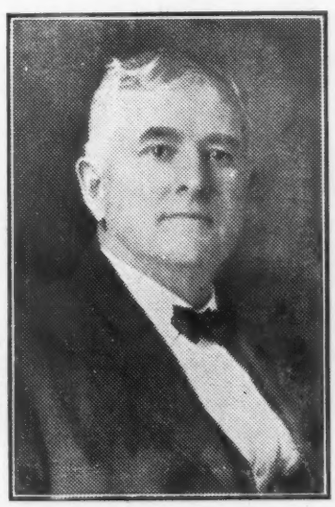
At Greece City 1876
At Petrolia 1877
At Karns City 1878



At Bradford 1880
At Duke Centre 1882
At Pittsburg 1889
At Washington 1891
At McDonald 1892
At Sistersville 1893
At Mannington 1894
At Robinson 1906-1911

"HIS NIBS"
UNDER-REAMERS—ALL SIZES FOR HIRE
S. W. MUNN, - - - Robinson, Ill.

Regular 1911 News.

ILLINOIS.

Summary of February Operations.

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Clarke	1	...	1	2	3	5
Crawford	39	835	9	2	35	37
Lawrence	39	1,967	10	10	90	100
Marion	5	710	..	2	17	19
Miscellaneous..	5	...	5	..	21	21
Total	89	3,512	25	16	166	182
Total Jan....	104	5,677	22	14	195	209
Difference ..	15	2,165	3	2	29	27

Decrease in completed wells, 15.
Decrease in new production, 2,165 bbls.
Increase in dry holes, 3.
Abandoned wells, 10.
Increase in rigs, 2.
Decrease in drilling wells, 29.
Net decrease in new work, 27.
Average of January wells, 66 bbls.
Average of February wells, 54⅝ bbls.

A review of the Illinois field for February shows a heavy decline in all branches of the oil industry. Fewer wells were drilled than for any previous month during the past few years, the number for once being below 100. The short month of the year failed to show but one gusher above the 200-bbl. mark, it being the first month for a long period that the famous Tracy and McCloskey sands failed to develop one or more gushers. The weather conditions have been against active operations and there is no territory in sight outside of the deep sand fields of Lawrence county and the Sandoval pool in Marion county. The Sandoval pool has been pretty well defined, but the producing area in the field is rich and turns out some very creditable producers. Out of 5 wells completed there during February, the production amounted to 710 bbls., which is a fine average, with no duster to record.

Several nice gas wells were found during February in the Lawrence county field, and just at this time they are more valuable than an oil producer, as the gas is getting rather scarce. There is plenty of gas to supply fuel for the wells, but at the rate the pressure is falling off it will not be long until other fuel will have to be used. In Petty township, Lawrence county, the Ohio Oil Company drilled in a 3,000,000-foot gas well in No. 2 H. S. Poland No. 1 farm, section 2. The gas was found in the 1,400-foot sand. Same company's No. 1 George W. Gray No. 4 farm, section 12, same township, produced 2,500,000 cubic feet, also from the 1,400-foot sand. Same company's No. 5 on the C. S. Wagner farm, section 2, produced 1,000,000 cubic feet from the 1,400-foot sand.

In Bridgeport township, Lawrence county, W. C. McBride drilled in a 2,000,000-foot well in the Tracy sand, in his No. 14 on the northeast corner of the William Crump 28-acre tract, section 31. The Ohio Oil Company's No. 17 Grant Clark farm, same section, produced 2,000,000 feet of gas from the Tracy sand.

In Honey Creek township, Crawford county, the Ohio Oil Company drilled in a light gas well in No. 1 E. B. Meeks farm, section 35, and another in No. 9 on the J. W. Baud farm, section 36, while the Shafer-Smathers Company has a light gas producer in No. 6 H. F. Jones farm, section 12. Hope, Epler and others also found a small gas well in No. 4 on the H. E. Highsmith farm, section 15, Robinson township, same county, and near New Hebron, Robinson township, developed one 200-bbl. well during the month, which is J. C. Donnell agent's No. 11 W. A. Alexander farm, section 20. The Crown Oil and Gas Company drilled a 200-bbl. producer in No. 9 J. & G. Apple farm, section 8, Oblong township, Crawford county. North of Bellair, in Licking township, in the northwest corner of Crawford county, the Commonwealth Oil Company's No. 9 well on the Susannah Smith farm, section 2, flowed 120 bbls. through the tubing the first 12 hours, but has settled down to a 70-bbl. producer. J. W. Salley and others in the same field drilled in a 180-bbl. producer in No. 7 S. J. Payne farm, section 11.

The Ohio Oil Company's No. 9 on the W. H. Snyder farm, section 25, Dennison township, Lawrence county, produced 225 bbls. from the McCloskey sand at a depth of 1,829 feet. The same company drilled in a 100-bbl. natural producer in No. 15. Alf. Vandermark farm, same section, and in the McCloskey sand at a depth of 1,833 feet, or four feet deeper than the Snyder farm well.

In Lawrence township, Lawrence county, the Ohio Oil Company has at last drilled in its test near Lawrenceville on the W. S. Hennissee farm, section 1, and has but a 5-bbl. producer. The oil was found in the Kirkwood sand at 1,602 feet, where it was given a shot. This well was drilled for the lower sands, but failed to find any showing of oil in any of them but the Kirkwood. The same company drilled in dusters in No. 7 C. E. Seed farm, section 10, and No. 5 J. A. Seed farm, section 12, while the Big Four Oil and Gas Company met with the same kind of luck in No. 16 E. J. Seed farm, section 16. The Linden Oil Company did better by drilling in a 200-bbl. producer in No. 2 R. M. Kirkwood farm, finding the oil in the Tracy sand at 1,772 feet. A 200-bbl. well was the best that the Petty township field of Lawrence county could produce during the month, and that was the Ohio Oil Company's No. 2 H. D. Regal No. 2 farm, section 35. The oil was found in the 1,600-foot sand.

In the Sandoval field, in Marion county, the Bridgeport Oil Company drilled in a 200-bbl. producer in No. 1 on the J. Bohner farm, section 8, while the Southwestern Oil and Gas Company found two of the same size producers in their No. 4 A. E. Benoist farm, section 8, and No. 2 F. Shaffnit farm, section 9.

Bond county certainly does not show up very encouraging, and the drilling in of the four last wells around the Brown farm producer, which were all in the duster list, represents a heavy loss to the Producers Company. Should the Ohio Oil Company's test drilling near the sand on the Peter Smith farm, section 28, Central township, same county, come in a failure, the talent will give Bond county a wide berth from now on. Old Ripley township, where the four dusters were drilled, is already given up as rank failure. The territory around Litchfield, in Montgomery county, also shows bad, as two dusters are credited to that field, one drilled by the Producers Oil Com-

GROUP AT TULSA, OKLAHOMA.

Front Row, left to right—W. C. Newell, D. W. Franchot, J. H. Evans, Harry Heasley, W. A. Watts, Mr. Ferguson. Back Row—J. Duffy, Harry Ross, H. F. Sinclair, Thomas White, Preston Langworthy, C. J. Wrightsman, M. Hughes, C. B. Farquarson, J. K. Ronne, P. J. White, E. Boggs, Fred Kelly.

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General Offices: 261 Broadway, New York

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Bartlesville, Okla.
Phone No. 46

STOCKS OF THE

NEW BEDFORD BOLT DRILLING CABLE

BARTLESVILLE, OKLA. MUSKOGEE, OKLA. COFFEYVILLE, KAN. TULSA, OKLA.

H. P. BOYD, Jr., & CO., Bartlesville, Oklahoma, January 2, 1911.
Bartlesville, Oklahoma.

Gentlemen: We have been using your New Bedford Cables in 2400 ft. territory continuously for the past six months. We do not hesitate to say that we have had 30 per cent more wear from this cordage than any we have used in this country.

Yours very truly, H. H. BREENE COMPANY.

H. P. BOYD, Jr., & CO., Bartlesville, Oklahoma, December 5, 1910.
Bartlesville, Oklahoma.

Gentlemen: The New Bedford Cables bought from you have given me more service than any rope I have worked on. I got ten 1150-foot wells out of one 1800-foot rope.

Very truly yours, S. F. FITZSTEPHENS.

H. P. BOYD, Jr., & CO., Ochelata, Oklahoma, September 22, 1910.
Bartlesville, Oklahoma.

Gentlemen: I have just finished my contract with the Minnehoma Oil Company and did not succeed in wearing out either cable. You certainly have the best cable that I have ever used. I figure that my cordage bill on these last contracts is at least $1,100.00 less than any previous cordage bill has been for the same amount of work.

Yours very truly, J. E. KASTOR.

J. F. BOGGS, President. E. O. BOGGS, Secretary.

BOGGS DRILLING COMPANY

H. P. BOYD, Jr., & CO., OIL AND GAS WELL CONTRACTORS.
Bartlesville, Oklahoma. Bartlesville, Oklahoma, August 10, 1910.

Gentlemen: In checking up the work done with your cables find, with five cables, average 2000 feet lengths, we have completed twenty-one wells in Osage Nation, deepest well 1960 feet. In our eleven years' experience, at times running twelve strings, the severest test on cables is in the Osage drilling, and feel it only fair to let you know that we consider the New Bedford Cables have given us fifty per cent more service than any other we ever used. Please save for us a 2000 ft. cable we will want the last of the week, and oblige.

Very truly yours, BOGGS DRILLING CO., J. F. Boggs, President.

ED. BOGGS—Your cables have saved contractors thousands of dollars.

C. W. BELL—Your cables draw perfectly.

JOHN A. STEEL—Your cables are all right. I want a 2500 ft. one at Cleveland.

SHAFFER BROS.—We have had better service from your cables than any we have used in ten years.

IONA DRILLING CO.—Please ship us another carload of cables same specifications as last car.

L. J. MILDREN—They are undoubtedly the best cable in the field today.

EDWARD McCUEN—Contracting for the Cudahy Oil Co.—Yes, Mr. Boyd, your ropes are hard to beat. We will want an 1800 ft. cable Monday.

LAWRENCE HIVICK—Your cables are doing the business.

D. R. BREST—No cables ever before were so satisfactory.

N. L. COVEL—Unquestionably the best cable I have used in this territory.

R. R. GLASGOW—I have not had as much wear out of a cable in twelve years as from the one you shipped me to Haskell.

JOHN DYSON—Ship us another 2¼-inch 2000 ft. rope. Your cables are great.

PAUL LOVELL—Every one of the eighteen cables you furnished me proved highly satisfactory.

B. M. GESSEL—The first cable you sent me is acting fine. You may ship two 2500-ft. cables and one 1000-ft. to Osage first of the week.

To the Well Drilling Contractors, Mid-Continent Oil Fields: Bartlesville, Oklahoma, February 11, 1911.

Gentlemen: On behalf of the New Bedford Cordage Co. and for ourselves we take this opportunity to express our thanks for the liberal patronage you have extended us during the past eighteen months. It has been said that the contractor tries to make good his losses by taking it out of the cordage man—our experience with you as a class is against the statement. We have sold you during the term named one-quarter of one million dollars worth of NEW BEDFORD BOLT DRILLING CABLES, and have found you almost to a man Fair, Square and Honorable. Other Cordage men are waiting for the NEW BEDFORD CABLES to "Fall Down"—They do not know Francis A. Bryant. NEW BEDFORD DRILLING CABLES are getting better and better, and this process will go on and on—until the acme of perfection shall have been reached.

Again thanking you, we are yours to command.

H. P. BOYD, Jr., & CO.

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pany and another by Huff & Nelson. The well drilled by Gibson, Veitch and others on the Fink farm, near Nashville, in Washington county, was another disappointment.

During February there were a total of 89 wells completed in the Illinois field with 25 dry holes and gas wells and a new production of 3,512 bbls., a decline from the January figures of 15 completed wells, and 2,165 bbls. production. In dry holes and gas wells February showed an increase of 3, while there were 10 wells abandoned over the field.

In new work under way there is also a heavy falling off. At the close of February there were 16 rigs up and 166 wells drilling, an increase of 2 in rigs up and a drop of 29 in drilling wells, showing a net increase in new work of 27.

INDIANA.

Summary of February Operations.

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Wells	1	1	..	1	2	3
Jay	3	22	..	..	..	..
Adams	..	...	..	..	..	..
Delaware	1	20	..	..	..	..
Randolph	..	...	..	..	2	2
Pike	5	10	4	..	8	8
Miscellaneous	..	...	..	..	8	8
Total	10	53	4	1	20	21
Total Jan.	14	142	4	1	21	22
Difference	4	89	..	..	1	1

Decrease in completed wells, 4.
Decrease in new production, 89 bbls.
Abandoned wells, 21.
Decrease in drilling wells, 1.
Net decrease, 1.
Average of January wells, 14 1-5 bbls.
Average of February wells, 8 5-6 bbls.

If the older Indiana field keeps up the pace it has been going for the past few months, there will be nothing doing in the field but the pumping of the old wells and the pulling out of those that have given up their entire production, which has been a great feature for the past couple of years. February was a bad month as far as weather conditions were concerned, otherwise the number of abandoned wells would have been much larger than it is. Only 21 of the old wells are on record as abandoned during the month, the smallest number of many months.

The Pike county field, in the southwestern section of the state, failed to do anything of value during the month. There were 5 wells drilled in, with only one an oil producer of the 10-bbl. kind. One was a good gas well, measuring 5,000,000 cubic feet, while the other 3 were rank failures. It now depends much upon what the southern section of the state will show. If oil is not found in paying quantities south of Indianapolis toward the Ohio river, then Indiana as an oil producing state will gradually pass off the records. There is still some chance south of Chicago, in the Kankakee valley, but the oil is of a heavy grade and shallow and nothing but light pumpers could be expected. There are many locations in the older fields of the state, but the scarcity of gas for fuel has made these locations unprofitable to drill.

During February but 10 wells were completed, of which 4 were dry holes and gas wells, the other 6 showing a production of only 53 bbls., a loss of 4 completed wells and 89 bbls. in production from the January figures.

In new work under way there is a decline of 1 in the general results. There is 1 rig up and 20 wells drilling against 1 rig up and 21 wells drilling at the close of January.

OHIO.

Summary of February Operations.

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Wood	15	221	..	8	15	23
Hancock	10	110	..	2	7	9
Allen	1	10	..	1	2	3
Augiaize	2	25	..	3	..	3
Sandusky	5	44	..	1	3	4
Mercer	..	...	..	..	1	1
Van Wert	2	80	..	1	..	1
Seneca	7	76	2	..	4	4
Lucas	2	23	..	1	2	3
Wyandot	..	...	..	1	..	1
Ottawa	..	...	..	1	1	2
Hardin	1	10	..	..	..	..
Putnam	..	...	..	..	..	..
Total	48	599	2	19	35	54
Total Jan.	45	508	5	17	47	64
Difference	3	91	3	2	12	10

Increase in completed wells, 3.
Increase in new production, 91 bbls.
Increase in rigs, 2.
Decrease in drilling wells, 12.
Net decrease, 10.
Average of January wells, 12 7-10 bbls.
Average of February, wells, 14 bbls.

The February figures in the Lima fields of northwestern Ohio show an increase in completed wells and production, while in new work there is a strong decline, due to weather conditions the large part of the month. There are 10 less drilling wells and rigs than there were at the close of January.

Hancock, Allen, Sandusky and Lucas counties were those that show a decline in the number of completed wells. Old Wood county shows a gain of 1, while Seneca county increased 3, as did Ottawa county. Van Wert county shows the best producer at the finish of the month, a well producing 70 bbls. natural, owned by the Ralph Bros. The sensational strike of the month was the 550-bbl. gusher drilled in by the Sun Company, in No. 10 on the J. W. Moore farm, in the Tiffin field, in Clinton township, Seneca county. The well started off at 525 bbls. and increased its production to 550 bbls. a day, where it remained for a few days, but water made its appearance and it dropped off at a rapid stride until now it has been put to pumping and has a daily production of but 60 bbls. The Tiffin field in the past has had quite a number of these gushers, but all have gone in the same manner, but when they do get settled down they remain for years.

Much lease work is being done south of the old Lima field in Hardin, Logan and other counties, and some test work will be done early in the spring. Hardin county at the present time is showing the best, as a few small pumpers have been found in Lynn township and the big gas well found in the southwestern part of Champaign county, still farther south, makes the territory look more inviting. Territory is being leased up as far south as Cincinnati.

During February there were 48 wells completed with 5 dry holes and a new production of 599 bbls. This is an increase over the February figures of 3 completed wells and 91 bbls. in new production.

In new work under way at the close of February there were 19 rigs up and 35 wells drilling. This is an increase of 2 rigs up and a decrease of 12 in drilling wells, making a net decrease of 10.

KENTUCKY-TENNESSEE.

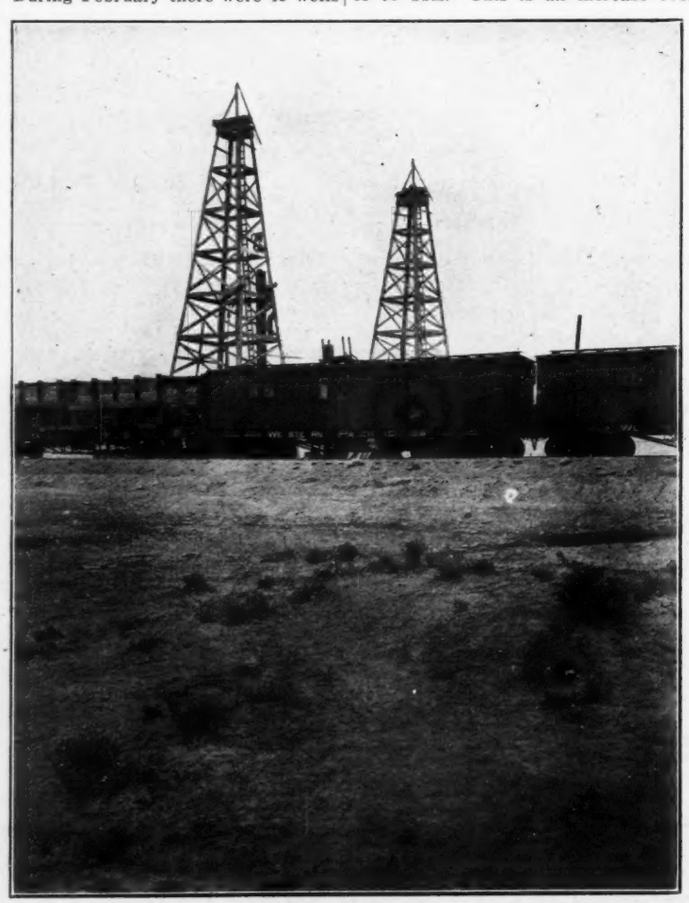
Summary of February Operations.

	Comp.	Prod.	Dry	Rigs	Drg.	Ttl.
Wayne	14	80	2	5	11	16
Boyd	..	...	..	..	..	..
Muhlenberg	..	...	..	..	..	..
Knott	1	...	1	..	..	..
Lawrence	1	...	1	..	..	..
Logan	*1	10	..	..	..	..
Hopkins	1	3	..	..	..	..
Henderson	1	...	1	..	..	..
Breckenridge	1	...	1	..	..	..
Wolfe	..	...	..	1	..	1
Webster	..	...	..	..	1	1
Total	20	93	6	6	12	18
Total Jan.	7	17	4	7	14	21
Difference	13	76	2	1	2	3

Increase in completed wells, 13.
Increase in new production, 76 bbls.
Increase in dry holes, 2.
Decrease in rigs, 1.
Decrease in drilling wells, 2.
Net decrease, 3.
Average of January wells, 3 2-5 bbls.
Average of February wells, 6 9-14 bbls.

The Kentucky-Tennessee field during the month of February made a large gain in completed wells and new production, but in new work under way there is a falling off. There are a number of tests in the western section of the state in the remote counties that when looked for are like a needle in a haystack. Were these rigs and drilling wells known they would show an increase in the new work column instead of a decrease. The condition of the roads in the Wayne county field have been so that material could not be hauled, which is one cause of the decline.

The figures for February show a total of 20 wells completed, of which 5 are dusters and 1 a gas well, the others having a new daily production of 93 bbls. This is an increase over



WELLS AT SULPHUR, NEV.

wells, 2 dry holes and gas wells and 76 bbls. in new production. The new wells have an average production of 6 9-14 bbls. each.

In new work under way there were at the close of February, 6 rigs up and 12 drilling wells, against the January figures of 7 rigs and 14 drilling wells, a decline of 1 in rigs up and 2 in drilling wells.

During the month failures were found in Knott, Lawrence and Henderson counties, while in Breckenridge county a small gas well was drilled in. Oil was found in both Hopkins and Logan counties in small amounts, but indicate that something better may be found in the vicinity.

CENTRAL OHIO GAS FIELDS.

Summary of February Work

	Comp.	Prod.	Gas	Dry	Rigs	Drg.	Ttl.
Licking	17	3	12	4	8	17	25
Fairfield	5	...	5	..	1	8	9
Knox	..	...	..	..	2	7	9
Hocking	6	...	6	..	2	5	7
Muskingum	4	105	1	1	..	..	..
Delaware	..	...	..	..	..	1	1
Perry	1	10	..	..	..	7	7
Ashland	1	...	1	..	..	3	3
Coshocton	2	20	..	1	1	3	4
Medina	1	...	1	..	1	1	2
Holmes	..	...	..	..	..	1	1
Richland	2	...	2	..	..	..	..
Total	39	138	28	6	15	53	68
January	49	35	37	11	20	72	92
Differences	10	103	9	5	5	19	24

Decrease in completed wells, 10.
Increase in oil production, 103 bbls.
Decrease in gas wells, 9.
Decrease in dry holes, 5.
Decrease in rigs up, 5.
Decrease in drilling wells, 19.
Net decrease in new work, 24.
Total gas production, 55,050,000 cubic feet.
Average gas per well, 1,966,071 cubic feet.

While there was quite a slump in completed work in the central Ohio gas field for February, when compared with the January figures, there were some very redeeming features. The leading feature of the month was the completion of an oil well in the southwestern section of Muskingum county, by the Columbus Gas and Fuel Company, in its test on the Johnson-Cone farm, in section 7, Hopewell township and about four miles north of Mt. Perry. The sand in this well was found at a depth of 3,035 feet, and when about 12 feet in the sand a showing of oil was found. Later on a shot was put in the well which became bridged, and while trying to break the bridge to clean out the well it flowed by heads at the rate of 100 bbls. a day. This is by far the best producer yet found in the gas area outside of the Bremen field. The well is located southeast of Newark and close to the Muskingum-Licking county line and west from Zanesville. With the development work that shows oil near Frazeysburg in the northwestern part of Muskingum county, and the Ashcraft well in the northeast corner of Licking county, which are something like 20 miles north from the Johnson-Cone farm, and the development at Junction City directly south of this new well, makes the territory between look rather good to the majority of the operators. The general opinion is that the Junction City-Bremen field will extend northward and may extend as far in that direction as the Medina development, which is almost on the direct north line. The prospects are such that nearly every available acre of land for miles to the north has been taken under lease, not only by the large gas companies, but oil operators as well. The gas people have been gathering in leases along this line for a couple of years and surely have the bulk of the territory under their supervision.

Another important find of the month was made by the Ohio-Rochester Oil and Gas Company, on the Mrs. Isaac Norris farm, section 12, Pike township, Coshocton county, three miles south of West Carlisle and about five miles northeast from the well drilled on the Ashcraft farm, by the same company, a couple of months ago. What the Norris well will do is yet unknown, as it is still cleaning out, but the showing is fairly good, and it should develop into equally as good a well as the Ashcraft.

Near Fultonham, in the southwestern

1900-1911 **Nothing Better**

Our Own Page

As an evidence of good faith with JOURNAL advertisers, to show our own belief in the efficiency of sensible advertising, we herewith submit a few thoughts bearing upon THE OIL AND GAS JOURNAL itself, knowing that they will be read and will leave a desirable impression with a number of the persons who read this page advertisement—for that is all that it is in the final analysis.

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4. These data relate to an industrial activity, and not to the persons involved in the activity— an impersonal history.

5. Every other publication printing petroleum news is confined to a restricted area—a local paper dealing in generalities outside its own geographical boundaries. Each one of these local publications magnifies the wells, the development, the individuals in its own field to the exclusion or discredit of other development, other individuals in other fields.

6. Every other petroleum publication, exclusive or in combination with local news of other industries, is a segment, is incomplete. Every other publication is partial to its own field or state, to the persons—or, perhaps, to one person or one interest—therefore prejudiced, and more apt than not to purposely or unintentionally overlook the interesting and valuabe developments in rival and competitive fields, or states, or countries. In some cases they are local "boosters" and foreign "knockers;" in other instances they are helpless, or uncomprehending, although living up to honest intentions.

Multum in Parvo

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One publication may be an advertising medium for the publisher's gain; another may be under obligations to a particular producing, manufacturing or marketing combine and interest; still another may be merely a petroleum supplement to the publisher's commercial, social, political and personal interests; some others have no technical knowledge of the petroleum and gas industries and furnish their readers with nothing but the most casual generalities, merely perfunctory mention to maintain a department in an arbitrary space—a comic supplement for idle readers.

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corner of Muskingum county, the Ohio Fuel Supply Company's test on the Emily Moore, in Newton township, showed for about a 3-bbl. well, but the owners considered it too small to pay, and the hole was abandoned. In the same vicinity, the Zanesville Light and Fuel Company's No. 1 on the William Lenhart farm, section 19, same township, was reported as showing for about 5 bbls. This development is located about eight miles southeast from the Johnson-Cone farm gusher. In Muskingum township, in the northwestern part of Muskingum county and between Frazeysburg and Dresden, the Shannon Oil and Gas Company, an English syndicate that purchased some leases from the Ohio-Rochester Oil and Gas Company, drilled its first test on the William Woodruff farm, section 14, and instead of finding oil, struck a gas well that is reported showing for close to 4,000,000 cubic feet. This well is to the east of oil production and shows that the heavy gas belt lies to the east of the oil.

The leading strike to be made to the most northernly end of the field, in Medina county, was a 5,000,000-foot gas well drilled by the Logan Natural Gas and Fuel Company, on the E. C. Wilson farm, in lot 41, Litchfield township, and a couple of miles southeast from the good oil producer on the Strannahan farm, drilled some time ago. To the extreme south end of the field, the Raccoon Oil and Gas Company drilled in what shows for a 10-bbl. producer in No. 2 on the John J. Pearl farm, in Monday Creek township, Perry county, and a couple of miles north of Maxville. South of Maxville a short distance, the Chartiers Oil Company's well on the George Hendricks farm failed to show any signs of oil or gas in the Clinton sand and the owners are going deeper in hopes of finding a pay in the Trenton rock. This will be an important test for the lower formations.

In Hocking county and west of the Gibisonville development, a test well was drilled by the Central Contract and Finance Company on the George Stump farm, in Perry township, and resulted in a gas well good for about 750,000 cubic feet. The finding of this well stirred up the gas and oil people and much leasing has been done in the southern part of Perry township of late, also many leases have been taken in other sections of the county.

Perry township, Licking county, showed a small well during the month, which was drilled on the Basil Staggers farm, section 21, and about four miles west from Frazeysburg. The sand was found at 2,962 feet, and the well drilled through the sand at 40 feet deeper.

During February there were a total of 39 wells drilled in, of which 28 were gas wells with a combined output of 55,050,000 cubic feet. Five of the wells were oil producers with a production of 138 bbls., and 6 failed to show either oil or gas and are listed as dusters. This is a decrease of 10 in completed work from the January figures. There was also a decrease of 5 in dry holes. In new work under way there is a heavy falling off as the roads have been in bad shape most of the month and it was almost impossible to move material to the leases. At the close of February there were 15 rigs up and 53 wells drilling, a decrease of 5 in rigs up and 19 in drilling wells from the previous month's figures, making a net decline in new work of 24.

THE PENNSYLVANIA GRADES.

February Field Operations Show a General Decrease.

PITTSBURG, March 1.—(Special.)—A decrease in completed work, a slight increase in new production, accompanied by an increase in the dry hole list, was the result of operations in the southwest Pennsylvania, West Virginia and southeastern Ohio fields during the past month. A short month and bad roads had a good deal to do with bringing about the difference between the first two months of the year.

The southwest Pennsylvania fields, comprising Allegheny, Beaver, Washington and Greene counties, completed 15 wells in February. Of this number 3 proved gas wells and the same number fell to the dry hole list. The 9 wells in the producing column gave 158 bbls. new production, an average of 17½ bbls. In January there were 12 producing wells completed and the aggregate new production was but 84 bbls., an average of 7 bbls. Both the increase in new production and the average was due entirely to one well, the No. 3, on the Katherine Hagan farm in Greene county. This well had an initial production of 900 bbls., and had it not been for its rapid decline the increase would have been much greater.

The lower southwest or West Virginia fields completed 108 wells in February, or 6 more than the preceding month. Of this number 61 proved barren of oil—37 were gassers—and the 47 listed as producers supplied 938 bbls. of new production, an increase of 129 bbls. over January. The average was just a little below 20 bbls. The average for January was 15¼ bbls. No large producers were completed during the month and the wells that showed the best average were found in Roane county's two new developments. The Gordon sand pool in Wetzel county and the Big Injun pool in Ellsworth district, Tyler county, are still unknown quantities. In the first named no new wells have been drilled to the lower formation and in Tyler county but one well was completed and proved a light pumper.

Southeastern Ohio.

The southeastern Ohio fields completed 82 wells in February. Of this number 26 were dry holes and 2 gassers. The new production amounted to 833 bbls., or 14 bbls. less than the aggregate for the preceding month. The average production of the 54 producing wells was a little less than 15½ bbls. For the month of January the average was about 14 bbls. The same number of dry holes and gassers were completed in the two months.

In the aggregate of new production, the deep sand territory in Fairfield, Perry and Hocking counties, furnished the largest amount. Hocking county to the south and southwest promises to become a factor in deep sand production. To the northeast, Muskingum county is looking up, and it will be no surprise if liberal extensions to the deep sand fields should be found in the directions named.

The three divisions, southwest Pennsylvania, West Virginia and southeastern Ohio, completed 205 wells in February. The new production totaled 1,929 bbls. Of the number of wells completed 95 proved barren of oil, leaving 110 in the producing list. As compared with the January record, this was a decrease of 9 in completed work, an increase of 189 bbls. in new production and a decrease of 7 dry holes. The average of the producing wells was about 17½ bbls. The average for the same three districts in January was 14 bbls. One large producer the Carter Oil Company's No. 1 on the Lekrone farm in the Bremen district, was almost entirely responsible for the increased average in southeastern Ohio.

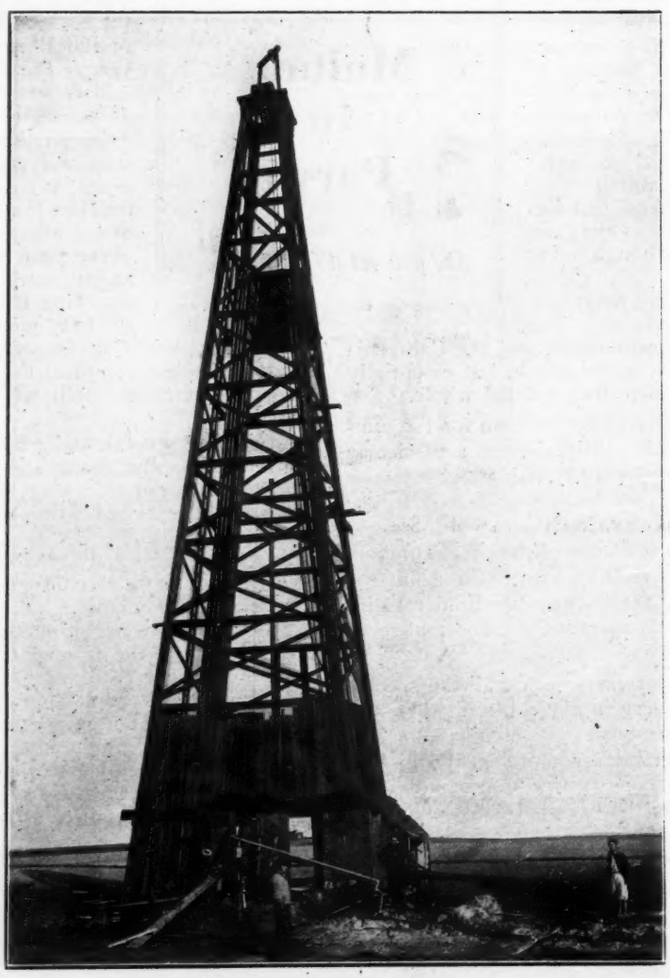
Status of New Work.

At the close of February, there was a decrease in new work in the three districts. Southwest Pennsylvania had 10 rigs and 30 drilling wells. As compared with the close of January this was an increase of rigs and a stand-off in drilling wells.

In new work, West Virginia suffered the greatest loss. At the close of February there were 75 rigs and 133 drilling wells, a total of 208. At the close of January there were 78 rigs and 150 drilling wells, total of 228, as against 208 at the close of January.

Southeastern Ohio had 41 rigs and 76 drilling wells, a total of 117. At the close of January there were 39 rigs and 74 drilling wells, which shows a gain of 2 rigs and 2 drilling wells. At the close of February, the three divisions had 126 rigs and 239 drilling wells, or grand total of 365. At the close of January there were 125 rigs and 254 drilling wells, or a total of 379, showing a net loss of 14. When the short month and the bad roads are taken into account, the disparagement between the two months is not greater than could have been reasonably expected.

At the present time there is no indication of an active resumption of operations in any quarter. Southwest Pennsylvania has nothing to offer as an inducement to start the drill when conditions are more favorable. West Virginia is in very much the same condition. In that state wildcatting has been almost suspended, despite the fact that there are still large areas that have not been fully tested. The deep sand territory in southeastern Ohio is growing interesting, and with the return of good roads there will be a large amount of new work started. It is expensive territory to develop, and the wells do not hold up for any considerable time at their initial production, but after they settle down prove consistent producers, and this alone is the incentive for the present activity and the continued search for new producing territory. With at least three additional counties showing profitable producers, the prospects for expanding the producing area of the field are most encouraging.



DRILLING AT MARATHON, TEX.
E. W. Hammond and M. D. Rowe in foreground.

REVIEW OF WEEK'S WORK.

Developments in the eastern fields during the past week furnish nothing of a spectacular nature. The southwest Pennsylvania, lower southwest and southeastern Ohio fields, completed about the usual number of wells, and none of any importance as to size or location. For the time being interest has shifted from West Virginia to the deep sand territory in southeastern Ohio. To regain prestige it will be necessary for the Little Mountain state to present something strictly new in both territory and an increased size of wells. The fields under development have been so fully defined that it is almost hopeless to look for anything better than ordinary producers.

In the lower southwest there are but two districts that are in doubt. The most important is the Gordon sand pool, on Fishing creek, Grant district, Wetzel county. The way the old well on the Margaret J. Welch farm has been holding up has inspired confidence in the future development of a Gordon pool. All the new work that has been started since the first well on the Welch farm was completed has secured production in the Big Injun sand and the wells put to producing from that formation, leaving the Gordon formation in a state of doubt.

On Middle Island creek, Ellsworth district, Tyler county, still less is known of the Big Injun development. The test on the Patrick Crow farm has been a creditable producer, but the test on the McKay farm is very light pumper and shows that an extension is not probable to the west. With the return of spring and good roads the territory in that section will be tried out and other good producers will no doubt be found in some direction from the one on the Patrick Crow farm.

But One Active Field.

For some months, at least, Roane county will continue to be the most active field in the lower southwest. In this county there is enough new work under way and more mapped out to keep the drill bouncing for a number of months. At the present time Roane county has about 60 wells drilling and rigs up and many locations made. The 15 producing wells completed during the month showed an average initial production of 27⅔ bbls. In addition to the producers there were 11 wells, 9 gassers and 2 dry holes completed. This was a very creditable showing, since many of the wells completed were drilled primarily for gas. Out of 26 completions there were but two dusters, which was a very small percentage of failures.

In the extreme lower southwest wildcatters are awaiting the return of spring and there will be another active campaign for new producing territory. There is nothing to indicate at this time the most likely spot or place to begin operations. In a few localities oil has been found in small quantities, but the formations are badly broken and experienced operators and inexperienced alike, shy at that kind of territory. There are not fewer than a half-dozen counties in the lower southwest that have not been so fully tested as to place them outside of the range of possibilities.

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Chicago, Ill.....202-210 South Water Street	Boston, Mass.....110 Federal Street	Kansas City, Mo.....1221-1223 Union Avenue
Indianapolis, Ind.....38-42 South Capital Avenue	Baltimore, Md.....37 Hopkins Place	Waco, Texas.....709-711 Austin Avenue
Louisville, Ky...N. E. Cor. 2d and Washington Street	St. Louis, Mo.....1213 Locust Street	Spokane, Wash.....1016-1018 Railroad Avenue
New Orleans, La..Cor. Common and Tchoupitoulas Sts.	Denver, Colo.....1556 Wazee Street	Atlanta, Ga.....7-9 South Broad Street
Omaha, Neb.....1218 Farnam Street	San Francisco, Cal.....416-422 Mission Street	Columbus, Ohio.....Cor. Long and Third Street
Richmond, Va.....1323 East Main Street	Seattle, Wash.....212-216 Jackson Street	Cleveland, Ohio.....61 Frankfort Street
Philadelphia, Pa.....220 South Fifth Street	Spokane, Wash.....1016-18 Railroad Avenue	Syracuse, N. Y.....212-214 S. Clinton Street
Dallas, Texas.....177 Elm Street	Tacoma, Wash.....1316-1318 A Street	Rochester, N. Y.....24 Exchange Street
Memphis, Tenn.....228 Front Street		Houston, Texas.....113 Main Street

The little development at Glenn's run, in Richland district, Ohio county, is furnishing more gassers than oil producers. There has been a commendable effort made to extend the producing limits of the pool, but the results have not been at all satisfactory. The gas wells have a market value. During the week the Natural Gas Company of West Virginia completed a test on the Mrs. Parshall farm and scored a total failure. The result of developments in this pool for the past four weeks has been one duster, one 10-bbl. pumper and two gas wells. At this time there is but one rig up and one drilling well in the pool.

The Buckeye Fields.

In southeastern Ohio the Clinton sand territory in Fairfield, Perry and adjacent counties is about all there is to it. Inside of defined limits, an occasional good producer stimulates new work, and the new producers in advance of developments are proving quite an attraction. In experimental work the deep sand territory promises to lead all other sections as soon as the conditions are favorable. In the old districts there is quite an acreage that has not been fully developed and the larger companies are not losing any time in starting new work Considerable producing territory, not fully developed, has changed hands in the past two months and the new owners will start developing it at once.

In the shallow sand districts light wells and a large number of dusters are all that have been completed during the past week. The occasional good producer in some one or more of the old districts failed to materialize and the best completion of the week is not better than a pumper.

In the river districts of Washington county there is a good deal of work starting. In the Lewisville district, in Monroe county, there is more new work than at any time in the past year. Neither Carroll nor Jefferson counties have anything new to offer. The Kilgore pool in the first named is a failure so far as extending its producing limits.

Gasoline Plants a Feature.

Both in southeastern Ohio and West Virginia, the converting of casing-head gas into gasoline is becoming quite a feature. In the Bens Run district, between Sistersville and St. Marys in Pleasants county, Schlagel & Fried have one of the best equipped plants on the James Wells farm of any in West Virginia. The plant was erected at a cost of $5,000 and has a capacity of 600 gallons a day. It is equipped with a 35-horsepower condenser and two 20-horse power gas engines. It has both the refrigerator and cold water systems for cooling the gas. The gas from the wells is very suitable for converting into gasoline and it sells readily at 11 cents a gallon.

D. S. W.

CENTRAL OHIO FIELDS BUSY.

JUNCTION CITY, O., Mar. 1.—(Special.)—Operations in the Junction City-Bremen field are quiet, on account of bad roads. In the counties adjacent to Fairfield and Perry there is some important test work under way. In Killbuck township, Holmes county, the Buckeye State Oil and Gas Company is down 2,900 feet on the John Arnold farm. In Washington township, Coshocton county, the Ohio-Rochester Oil and Gas Company is drilling at 2,800 feet on the W. A. Dickerson farm. The Columbus Gas and Fuel Company has started a test on the J. W. Phillips farm and has a rig up on the H. B. S. Miller lease. In Bradford township, Coshocton county, the Tunnel Hill Oil and Gas Company drilled to the top of the sand on the A. Kiel farm, but is delayed by a fishing job. In Muskingum county the Blue Rock Oil and Gas Company has started to drill on the L. H. Swigle property.

Three miles northeast of Bremen, in Rush Creek township, Fairfield county, the Carter Oil Company has completed and shot its test on the E. Lekrone farm and it started to flow at the rate of 22 bbls. an hour, giving it the best record of any late completion in the Clinton sand field. The first 24 hours after it was drilled in it placed 405 bbls. to its credit. The production for the second 24 hours showed quite a decline, amounting to but 280 bbls. It is located 600 feet south of the same company's No. 2 on the L. H. Henry farm. In the same township, the Carter Company has completed No. 3 on the John Stoner farm, and has a showing for a 25-bbl. producer. The well is located 600 feet east of No. 1, on the same farm, which started off at better than 100 bbls. a day. The Purvis-Turner Oil Company is drilling No. 1 on the W. B. McCandlish farm. The Carter Oil Company has completed and shot No. 2 on the George McCandlish farm, and has a 25-bbl. producer. It is located 800 feet east of No. 1 on the same farm. Same company is drilling No. 7 on the Hufford farm. Same company's test on the C. A. Black farm has been drilled in the sand, but is delayed with a crooked hole.

The Avalon Oil and Gas Company has drilled in its No. 10 on the Margurite Holliday farm, and has a show for a 50-bbl. producer. Weirick and Nolder, who secured the Union Oil and Gas Company's lease on the Mary Young farm a short time ago, are starting No. 3, located 600 feet southeast of No. 4 on the J. V. Purvis farm. The Purvis Oil and Gas Company is starting a test on the Sarah McCandlish farm, located 600 feet north of the Carter Company's No. 3 on the James Voris farm.

In Reading township, Perry county, the Stetson Oil and Gas Company completed its test on the W. H. Petty farm, near Carthon, O., through all the sands, and has a duster. The Southern Company has a rig up for No. 2 on the Edward Griggs farm, east of Junction City. An English syndicate has a derrick erected for a test on the Charles Gabelin farm, just east of Junction City. The lease was formerly owned by the Alberta Company.

In Jackson township, Perry county, the Southern Oil Company is starting a second test on the E. A. Griggs farm. The same company is drilling No. 3 on the R. J. Snyder farm. The Carter Company is drilling tests on the Otto Lacy, Daniel Ashbaugh, J. W. Purvis and A. G. McVeigh farms.

In Scioto township, Jackson county, the Jackson Oil and Gas Company is drilling an important wildcat test on the W. Johnson farm. There are more wells in the old development now producing 50 or more barrels a day, than at any time since mid-summer of last year.

In Falls Gore township, Hocking county, the Griffin Producing Company's No. 1 on the Wm. Williams

GROUP AT TULSA, OKLAHOMA.

Front Row, left to right—H. Broderick, W. C. Newell, E. R. Perry, J. E. Crosbie, Lee Agee, Charles Conneely, Archibald Campbell, J. H. Caldwell. Back Row—Thomas White, C. J. Wrightsman, Sam Rabinovitz, J. F. McMahon, L. A. Wallace.

farm is holding at 75 bbls. In the same locality G. L. Chilton's No. 1 well on the T. S. Wright farm is producing 65 bbls. a day. The Diamond Oil and Gas Company's No. 2 on the J. S. Rankin farm, 50 bbls.

In Hopewell township, Muskingum county, a Columbus test on the Johnson-Cone farm, section 7, has been producing at the rate of 100 bbls. a day, while cleaning out. The hole stands full of fluid, but the gas pressure is too light to make it flow. The well is attracting a great deal of attention and its location is far enough in advance to show a liberal extension to the deep sand territory.

In order to market the output of the 100-bbl. well on the Johnson farm just east of Gratiot, a force of workmen started to lay pipe line to the Mt. Perry railroad station, where the product will be loaded in tank cars. The Columbus Gas and Fuel Company, which drilled in the well, is preparing to drill several more. R. H. W.

SOME KENTUCKY PRODUCT.

LEXINGTON, Ky., Feb. 27.—(Special.)—For the first time in a long period the Kentucky field makes a much improved showing. The week shows six completions due to the activity of the Porter Bros. in drilling on the Fraz. Gibson lease in the Steubenville district of Wayne county, where they rushed in four shallow sand wells. No. 1 produced 1 bbl.; No. 2, 3 bbls.; No. 3 was a duster, while No. 4 produced 10 bbls. In the Slickford district, same county, W. E. Woodrow drilled in a 5-bbl. pumper in No. 8 Jesse Patton farm.

Pennsylvania Crude and Refined Oils.

Year	Avg. daily bbls.	Avg. price bbl.	Ref. per gal.	Crude per gal.	Total stocks
1870..	15,350	$3.90	.26⅜	9½	544,626
1871..	15,800	4.40	.24¼	10½	532,000
1872..	17,925	3.75	.23⅝	8⅞	1,084,423
1873..	27,106	1.80	.18¼	4¼	1,625,157
1874..	29,937	1.15	.13	2¾	3,705,639
1875..	24,075	1.24¾	.13	2⅞	3,550,200
1876..	24,505	2.57⅝	.19½	6⅛	2,824,739
1877..	35,988	2.39⅝	.15¾	5⅝	3,127,837
1878..	41,544	1.17⅛	.10⅜	2⅜	4,615,300
1879..	54,206	0.85⅝	.08⅛	2	8,552,256
1880..	71,114	0.94⅛	.09⅛	2¼	17,145,104
1881..	75,004	0.85½	.08	2	25,761,051
1882..	82,338	0.78½	.07⅜	1⅞	34,335,144
1883..	63,365	1.05⅞	.08⅛	2½	35,715,565
1884..	65,129	0.83⅝	.08¼	1⅞	36,872,892
1885..	56,921	0.88⅜	.08⅛	2⅛	33,539,038
1886..	70,679	0.71⅝	.07⅛	1⅝	33,367,898
1887..	58,646	0.66⅝	.06⅜	1½	28,357,112
1889..	58,869	0.94½	.07⅛	2¼	10.904,793
1890..	82,376	0 86⅝	.07⅜	2	9,295,514
1891..	98,191	0.66⅞	.06⅞	1⅝	15,343,233
1892..	91,328	0 55½	.0607	1⅜	17,395,389
1893..	85,926	0.64	.0524	1½	12,111,183
1894..	84,334	0.83⅜	.0519	1⅞	6,336,777
1895..	84,820	1.35¼	.0736	3¼	5,161,905
1896..	92,815	1.19	.0698	2⅞	9,550,583
1897..	96,357	0.78⅜	.0591	1⅞	10,789,652
1898..	86,706	0.91⅛	.0631	2⅛	11,541,753
1899..	85,206	1.29⅞	.0798	3	13,163,819
1900..	99,049	1.35¼	.0845	3¼	13,174,716
1901..	91,541	1.20⅝	.0748	2⅞	9,429,420
1902..	87,032	1.23¾	.0733	2⅞	5,699,127
1903..	84,788	1.59	.0863	3⅜	4,823,199
1904..	83,157	1.62½	.0820	3⅞	6,355,512
1905..	77,122	1.39⅝	.0722	3¼	3,503,398
1906..	72,953	1.59¾	.0761	3⅝	4,937,392
1907..	70,393	1.74½	.0830	4	5,951,784
1908..	69,536	1.78	.0865	4¼	3,306,893
1909..	63,366	1.60½	.0477	3⅜	5,384,904
1910..	72,952	1.37	.0414	3¼	4,541,385

TEXAS CITY REFINERY ELECTION.

The annual meeting of the stockholders of the Texas City Refining Company was held at the refining plant in Texas City, when the following directors were elected: L. A. Kelsey, North Tonawanda, N. Y.; W. F. Hammett, Tulsa, Okla.; J. D. Phillips, Casey, Ill.; J. S. Gial, Warren, Pa.; W. A. McVitie, R. P. Clark and W. A. Guyton, Galveston.

CANADIAN DEVELOPMENT.

BRANTFORD, ONT., Feb. 25.—(Special.)—I drove out yesterday to Mr. Howell's farm. He recently got another well at 500 feet, which is said to be flowing 25 bbls. a day. Mr. Allen, on the adjoining farm, has a well about 650 feet deep, said to be yielding 15 bbls. a day. There are several other wells near by which have some gas and a little oil, owned by the farmers, who just let them flow of themselves. I am told they would probably get a good deal more oil if they pumped them properly. These wells are in the township of Onondaga, about seven miles from Brantford. All the land in that neighborhood has been leased and operators from Petrolia, Ont., have been coming in and securing leases.

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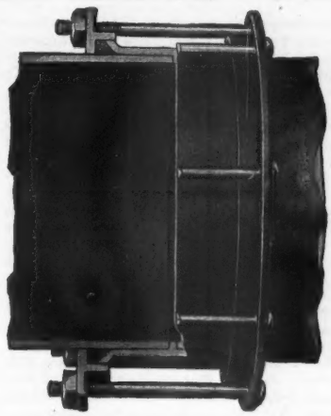

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Tees,
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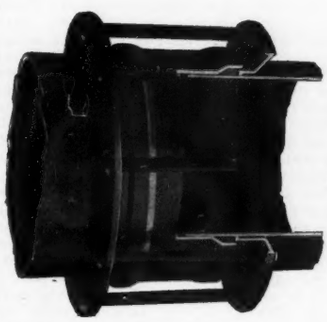

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COALINGA, KERN RIVER, MIDWAY, MARICOPA, FULLERTON, VENTURA

LATE CALIFORNIA OPERATIONS.

The Agency Closes Contract With Associated—Field News.

LOS ANGELES, March 1.—(Special.)—The Agency has sold to the Associated 2,555,000 bbls. at 42.5 cents per bbl. delivery in one year, subject to approval by the Agency directors. The agreement rejected by the Agency members disposed of 4,500,000 in the same time at 35 cents, relieving that much from storage charges. Under the new contract 2,000,000 bbls. will remain to pay six cents for the years' storage. The Union Oil Company relinquishes its right to 10 per cent commission as selling agent.

Hon. Lee C. Gates, state senator from Los Angeles county, has a resolution pending the state legislature and now in the hands of a committee calling for a state investigation of the Southern Pacific's title to oil lands. It is uncertain when it will be reported.

California Relief Law.

Both houses of Congress have passed the bill for relief from the Yard decision. In the senate the bill was amended, with concurrence of the house, to change last paragraph, which in the original bill read: "Provided, however, that such lands were not at the time of the entry into possession thereof covered by any withdrawal," so that it now reads: "Provided, however, that such lands were not at the time of inception of development on or under such claim withdraw from mineral entry." It is thought that this change may seriously affect some claimants. A. R. H.

CALIFORNIA IN 1910.

LOS ANGELES, Feb. 15.—(Special.)—During 1910 California produced 74,750,700 bbls. of crude oil, exclusive of field fuel consumption. Various estimates have been made, but this is closest to the actual output that went to market. The highest estimate is in excess of 77,000,000 bbls. This is accounted for in two ways: by including the field consumption, an uncertain factor at all times, but enormous in some fields, notably in Kern River, where there is no adequate gas supply, and steam is used very largely and crude oil burned; and the failure of some statisticians to allow for water and sediment, notably at Santa Maria, where the proportion of water coming from the oil field is enormous. The figures here given are net after the water has been completely extracted, and it will be observed that they are much less than others. There is always a difference in detail of the work of statisticians.

The following is a detailed statement:

San Joaquin Valley.

	1910	1909	Inc. or Dec.
Coalinga	17,938,205	15,209,328	2,728,877
Kern River	13,789,272	15,018,294	*1,229,022
Midway	10,498,006	2,363,745	8,134,261
Maricopa-Sunset	8,749,047	1,947,425	6,801,622
McKittrick	3,431,936	5,085,613	346,323
Total	56,406,466	39,624,405	

Southern Fields.

Salt Lake-Sherman	3,228,262	3,476,674	*248,412
Los Angeles City	453,330	554,070	*100,740
Whittier-Coyotes	1,182,988	945,316	237,672
Fullerton, Puente, Brea Canyon	5,018,720	4,351,845	666,875
Ventura County	491,842	409,035	82,807
Newhall	148,757	126,337	22,420
Total	10,523,899	9,863,277	660,622

Coast Fields.

Santa Maria	7,750,423	7,993,743	*243,320
Summerland	69,912	64,052	5,860
Total	7,820,335	8,057,895	237,460
Total all fields 1910			74,750,700
Total all fields 1909			17,205,123
Total increase			17,544,577

*Decrease.

Field Development.

The Lost Hills and McKittrick Front were the only new districts proven during 1910. Kramer, Newport Beach, Calabasas (Los Angeles county), Mono county; parts of San Luis Obispo county, including a large area west of Paso Robles, and Parkfield; Elk Hills and Devil's Den remain prospects. Tunitas, or Half Moon bay, near San Francisco, is still unproven, except as to the small shallow wells drilled years ago that now furnish fuel for development.

Last year wildcat fields were abandoned as follows: The Associated, Buell ranch, Santa Barbara county, three wells, and one well ten miles from the city of Santa Barbara; the Standard, Monterey and San Benito counties, six wells; other companies, same district, two; Standard, Repetto hills, two; Rowland, same, one; Belle Vernon, same, one suspended. Abandonments in prospective fields where others are still drilling were as follows: Santa Monica-Sawtelle, Amalgamated, one; same, Union, one; same, Belle Vernon, drilling one; Newport, Balboa Oil Company, one abandoned; same, Newport Bay Oil Company, one abandoned, one drilling; Clyde Jackson, same, one drilling; La Habra valley, Graham-Loftus Oil Company, one abandoned; Amalgamated, same, one drilling; Shaffer Oil Company, same, one drilling; Union, same, two drilling; Coyote hills, Murphy and Whittier-Des Moines, one drilling each.

In Inyo county the Roosevelt Oil Company was drilling about 150 miles from the nearest production during most of last year. Absolutely nothing is known as to results or whether work is still going on. Information is also equally vague regarding Mono county, which is without railroad communication.

The only marked extension of established fields last year was in Midway and Sunset. The Lakeview, the year's sensation, was on the edge of the belt proven as regards the upper sand, but was the first to explore the lower depths, to this extent opening a big extension. The old field in McKittrick was not extended; on the contrary, its prospective limits were more sharply defined by several failures. Kern River was not extended in any direction, although work is under way that may extend it to the north, east and northwest. To the west and south, called the Kern River Front, several wells have failed since the first of this year and others are suspended. On the Kern River bluff the Santa Fe is still trying to shut off the water in a deep well drilled last year, in which it is thought oil has been found, but it is impossible to determine its value. Coalinga was extended only around the edges, its development being within the proven area, although work is in progress that may enlarge this.

On the Coast the Cat Canyon section of Santa Maria was extended considerably by the Dome, Brooks, Union and Associated. Arroyo Grande went back. Never producing oil for the commercial market, its few wells fell off and today it yields about 600 bbls. per month, all consumed in drilling.

In the south the Union proved a good part of the La Hadra valley-Coyote hills region by the Bastanchury well. The Whittier field was enlarged slightly around the edges and development of the proven belt increased production. Fullerton and Puente failed to extend their area, but deep drilling established the existence of rich lower strata in Puente. The Salt Lake-Sherman field was not extended at all, but on the contrary its prospective limits were greatly contracted. Newhall greatly increased its output through development, but its area was not extended. In Ventura county there was a substantial extension of the light-oil belt at Piru and a considerable extension of the belt and a substantial production added in the light-oil section of Little Sespe canyon.

For the purposes of comparison the figures of last year for 1909 are used. Until 1910 there were no net statistics available and for 1909 generally included field fuel and are not as accurate as those for 1910, but sufficiently so to show the great increase, which is here figured at 17,544,577. Every field in the state increased its output except Kern River, Salt Lake-Sherman, Los Angeles city and Santa Maria. Were more accurate figures available for Santa Maria in 1909 it is probable that the decrease would be less as the 1909 figures seem high. They include probably a considerable quantity of water, of which full account was not taken.

Surplus.

On December 31, 1910, the field storage for the state was 25,120,000 bbls., in addition to which the pipe line companies had on hand sufficient stocks to bring this up to 32,000,000 in round numbers, which is very close to the exact figure, which is not furnished for publication. Field storage was as follows: Kern River, 18,000,000 bbls.; McKittrick, 1,040,000; Sunset-Maricopa, 3,800,000; Midway, 725,000; Coalinga, 1,188,000; Salt Lake-Sherman, 250,000; Los Angeles city, 25,000; Whittier-Coyotes, 90,000; Fullerton, Brea canyon and Puente, 410,000; Ventura county, 75,000; Newhall, 15,000; Santa Maria-Lompoc, 685,000; Summerland, 15,000. Total, 25,120,000.

Year's Prices.

In 1910 prices declined greatly. From 63 cents, contract price during 1909, the Agency's returns fell to an average of about 39 cents, or a little under; for daily runs the price was cut first from 50 to 40 cents and then to 30. On the other hand, a number of contracts for high gravity crude were made at 60 and 65 cents, but these were not sufficient to raise the general average very much, as far more oil was handled at the lower figures than at the higher; also, there was a great deal more oil held over in storage than there was in 1909, the total increase of storage being 12,000,000 bbls. The general average for the state may be put at 40 cents, which is giving a very fair allowance. At this average the total value of oil in 1910 was $29,900,000, which is just about the same as in 1909, the decline in the average price offsetting the increase in production.

CALIFORNIA EXPORTS IN 1910.

SAN FRANCISCO, March 1.—(Special.)—Crude and refined oils worth $2,077,209 were exported to foreign countries, including Panama and the Philippines, in 1910. A feature was the increased exports of residuum, of which 101,584 bbls. went to Chile and Peru. Prior to 1910 no residuum, other than small samples, had been exported.

The fuel shipments, crude and residuum, amounted to 1,442,266 bbls., valued at $959,776, an increase over 1909 of 396,140 bbls. and $288,822. Exports of refined oils were 30,838,334 gallons, valued at $1,335,950, a decline from those of 1909 of 17,722,661 gallons and $1,003,939. The total value of all exports, both crude and refined, last year, was $911,963 less than in 1909.

Naphtha exports were 10,627 gallons less in amount, but $7,177 more in value; illuminants, 18,073,329 gallons less in amount and $1,021,407 less in value; lubricants increased over 1909 by 361,293 gallons and $11,291.

Shipments of fuel, crude and residuum, increased as follows: Chile, 56,596 bbls., $26,527; Guatemala, 91,000 bbls., $54,600; Panama, 241,010 bbls., $115,850; Peru, 124,706 bbls., $98,715. There were small shipments both years, not large enough to be of importance, to several countries. In 1909, 15,476 bbls., valued at $16,250, went to Canada and in 1910 none. The average price per barrel in 1910 was 66 cents and a fraction and in 1909 64 and a fraction. The average value of illuminants exported in 1910 was a fraction under four cents per gallon, in 1909 4.59; naphthas, value in 1910, 20.6 cents; in 1909, 10.3; lubricants, value in 1910, 24.2 cents.

Exports to the Chinese empire last year were less than in 1909 by 488,642 gallons and $57,014; to Hong Kong they were 342,654 gallons more than in 1909 and $7,530 more in value. Japanese shipments, which increased greatly in 1909 over 1908, declined in 1910 by 17,921,223 gallons and $965,149.

ALASKA AND HAWAII EXPORTS.

SAN FRANCISCO, March 1.—During 1910 the total value of oil shipments from this port to Alaska, Hawaii and Tutuilla (Samoa) was increased $519,150 over that of 1909. Shipments of crude and residuum to Hawaii and Alaska in 1910 were 1,509,667 bbls., an increase over 1909 of 569,712 bbls., an increase of values for the same period of $501,715. Alaskan shipments increased by 83,374 bbls. and in value by $88,842; Hawaiian shipments in the same period increased by 486,338 bbls. and in value by $412,873.

Shipments of refined goods in 1910

CALIFORNIA PETROLEUM RECORD.

Year—	Wells	Dry	Barrels	Value	Price per bbl.
1870	....	....	3,600	$ 5,125	....
1871	....	....	5,200	7,370	....
1872	....	....	6,500	9,876	....
1873	....	....	6,500	10,920	....
1874	....	....	7,700	11,540	....
1875	....	....	8,400	12,090	....
1876	....	....	9,600	15,410	....
1877	....	....	12,750	18,140	....
1878	....	....	15,227	22,780	....
1879	....	....	19,858	29,672	....
1880	....	....	42,399	68,450	....
1881	....	....	99,862	130,678	....
1882	....	....	128,636	172,730	....
1883	....	....	142,857	206,540	....
1884	....	....	262,000	428,600	....
1885	....	....	325,000	613,920	....
1886	....	....	377,145	642,785	....
1887	....	....	678,572	1,357,144	$2.00
1888	45	30	690,333	1,380,666	2.00
1889	10	4	303,220	368,048	1.21
1890	10	5	307,360	384,200	1.25
1891	40	15	323,600	401,264	1.23
1892	60	20	385,049	561,333	1.46
1893	75	25	470,179	608,092	1.29
1894	75	20	783,078	1,064,521	1.36
1895	100	25	1,245,339	1,000,235	.80
1896	175	30	1,257,780	1,180,793	.94
1897	200	40	1,911,569	1,918,269	1.00
1898	275	50	2,249,088	2,376,420	1.05
1899	300	60	2,677,875	2,660,703	.99
1900	500	100	4,329,950	4,152,928	.95
1901	1,116	209	7,710,315	2,692,189	.40
1902	422	102	14,356,910	4,692,189	.32
1903	398	75	24,340,839	7,313,271	.30
1904	458	158	29,736,003	8,317,809	.28
1905	252	8	34,275,701	9,007,820	.26
1906	174	7	32,624,000	9,238,020	.28
1907	309	11	40,311,171	16,783,943	.41
1908	617	23	48,306,910	26,566,181	.54
1909	858	102	58,191,723	32,398,187	.60
1910	1,140	136	76,300,000	38,150,000	.40
	7,618	1,255	460,066,564	$212,893,388	.....

increased over 1909 by 217,702 gallons and in value declined by $11,405.

Alaskan shipments were 478,590 gallons greater in amount and Hawaiian shipments were less by 945,946 gallons. In 1909 there was shipped to Samoa 2,725 gallons of naphtha valued at $428; in 1910 the same item is only 200 gallons, valued at $43. The following table shows in detail the exports of crude, residuum and refined products, with their value, in 1910, in detail:

Fuel Oil, 1910.

	Crude	Residuum		Value
Alaska	397,000	1,016	398,016	$ 422,216
Hawaii.	1,102,000	9,651	1,111,651	950,222
Totals	1,499,000	10,667	1,509,667	$1,372,438

Value Asphalt Exports.

Destination	1910	1909	Inc.
Argentina	$ 45	$.....	$ 45
Australia	345	431	86
Canada	13,827	26,813	12,986
Chili	664	.....	664
China	.....	496	496
Germany	925	1,520	595
Guatemala	590	.....	590
Hong Kong	.....	119	119
Italy	.....	19	19
Japan	1,807	2,253	446
Mexico	97	464	367
Philippines	.....	410	410
Straits Settlements.	144	594	450
Totals	$18,144	$33,119	$14,675

Total decrease, $14,675.

AMERICAN OIL FIELD BONDS.

LOS ANGELES, CAL., March 1.—The American Oil Fields directors have offered $1,000,000 in bonds at 80% par with accrued interest, to stockholders only, within 60 days from February 11, with the option of exchanging bonds any time within two years for twice their face value in stock. The option applies only to these particular bonds; subscription rights are non-transferable and terms of payment not extending more than six months will be determined by the treasurer.

The offer is made, it is explained, as the company cannot cut down development, while upon it depends the determination of the value of a large acreage which it will procure at a nominal price, if successful, and upon which great hopes are placed. Land agitation also renders vigorous development essential, wherever discoveries have not been made, to protect location rights. The company is thus kept busy developing remote lands from which no immediate returns are expected, although all its customers are supplied.

The company has 16 producing wells and 26 drilling. Its lands represent an investment of $1,581,200, of which $1,351,200 is paid. The company also owns the entire stock of three other companies and 50 per cent of that of the Barnodon, which owns and claims 17,468 acres in McKittrick, Midway Sunset and Lost Hills. It is stated that no American Oil Fields land is affected by the presidential withdrawals. Lands of above subsidiary companies cost the American Oil Fields $329,605.73 cash, 157,753 shares of stock and $293,700 in bonds. All issued stock was used to buy lands or other companies stock, or was used as a bonus with bonds, none was sold for cash. Development, including storage for 1,500,000 bbls., has cost $898,149.95.

In ten months' existence, the production has been 2,451,245.69 bbls., of which 1,185,703 were sold for $583,885.27, leaving in storage approximately 433,656.86 bbls., worth at company's average contract price of 49.24 cents, $213,532.64; consumed in development, 41,884.93 bbls.; lost by evaporation and seepage in temporary reservoirs, 600,000 bbls.; cost of production not chargeable to capital account, $45,052.62; dividends, $363,400; surplus to credit of production, $175,432.65. It is stated that the bond issue is made to enable the company to pay dividends.

ROCKY MOUNTAIN REGION.

During 1910 much interest was manifested in the Rocky Mountain region, in the states of Colorado, Wyoming and Utah, in the increasing efforts to discover new producing territory that will prove commercially profitable. Colorado has been a producing state for some years, at Florence and Boulder, but has never ranked very high, and the development and utilization of the product have been of a purely local character. Florence was the first field opened, becoming a commercial factor, at least for statistical purpose, in 1900, although producing wells had been drilled twenty years ago, one of which is still producing 10 barrels a day, its initial production when drilled nineteen years ago having been 250 barrels. Boulder became known as a statistical factor in 1902, when the production was 11,800 barrels, and had increased to 86,000 barrels in 1910. The Florence production in 1900 was 317,385 barrels, reaching its maximum in 1904, when it was 483,596 barrels, declining to 225,062 barrels in 1909. The government report for 1910 credits Colorado, Wyoming and Utah with a production of 347,000 barrels, Wyoming and Utah put at 36,000 barrels. Most of the oil produced in Colorado comes from shale formations rather than a regular sand, one producing well being 4,000 feet deep. Geological explorations rather incline toward the theory that the presence of petroleum along the base of the mountains, in narrow streaks that dip very abruptly, is the result of seepage and displacement during the disturbances that uplifted the mountains, and drilling rather tends to confirm that theory. There has been a refinery at Florence for many years that takes all the crude produced at $1.50 a barrel, or around that figure. The crude is of high specific gravity that permits the manufacture of by-products, the Boulder crude being of the same general character. The refinery people at times offer inducements to the local producers and operators in order that the supply may be preserved, but in recent years there has been no boom and the globe-trotting oil man does not enthuse there.

In Wyoming numerous attempts are being made to open profitable fields all over the southern and eastern half of the state, also in the extreme northwestern corner, but it seems to be an uphill journey. Practically all the commercial production of the state is at Spring Valley, near Evanston, in the southwestern part, and in the Salt creek valley near Casper, in the central part. There is some drilling going on at both places, and at Spring valley the crude is refined, while at Lander, where the crude is heavy, it is used for fuel by the Fremont, Elkhorn and Missouri Valley railroad and by the Cudahy Packing Company at Omaha. Two small refineries are located in the Evanston field and a pipe line and pumping plant at Lander. Exact figures are not obtainable, but the Evanston production does not exceed 300 barrels a day, nor does the Lander field exceed that amount, more likely both would be under that if actually gauged. The government report credits the entire state with only 100 barrels a day, but in the last three months a number of fair wells have been completed and the production slightly increased. The withdrawal of government lands from entry and filing has seriously complicated the situation in Wyoming and Utah and prospectors and leasers are not doing much. Titles have been difficult to adjust, and the operating expenses have deterred the active exploitation of the Wyoming fields. Near Byron, in the northwestern corner of the state, several shallow wells showed production and a small refinery was put up to handle the crude, but litigation has kept the work down. At Gray Bull, in the central northern part of the state, several fair gas wells were drilled, with a little oil showing, but the work was abandoned. A number of oil operators and public men recently organized an association for the promotion of the petroleum industry, Governor Brown being actively identified with the movement. Three companies, composed of German, French and English promoters, are trying to iron out differences, as to title and capital, claiming to be in position to expend considerable money to develop their holdings as soon as the government definitely settles the tenure of mineral lands in Wyoming.

Utah, within a year, has been exploited for petroleum, in the San Juan valley in the southeastern part of the state, Mexican Hat serving as the euphonious name of the field camp or town, 125 miles over the range from Dolores, Col., the nearest railroad point. Four or five producing sands are found, from 400 feet down, but none of the wells have yet been put to producing sufficiently to demonstrate what may be expected from the field.

The Rocky Mountain region extends north into the Alberta province of Canada, where one strong gas well and several lighter ones, with numerous showings of oil, have been found, in the Medicine Hat district. The Canadian Pacific railroad is using the natural gas for illuminating its passenger trains. It is a great expanse of country, but remote from communication and expensive to operate in under present conditions.

SNAPPED IN CALIFORNIA.

Col. Tim. Spellacy, Col. Wm. C. Roberts and Hon. Richard G. Hollaman, Eastern Capitalists, on the Premier property of the California Consolidated Oil Company.

PETROLEUM IN MEXICO.

The year 1910 practically begins the petroleum era in Mexico. Before that time, while there was considerable development and prospecting over an important area along the eastern or gulf coast of Mexico, the production was negligible and had declined from 7,000 bbls. a day to about 5,000 bbls. of heavy oil used almost exclusively on the government system of railroads. E. L. Doheny and associates, of California, began to secure land nearly ten years ago and five years ago had done enough prospect drilling to demonstrate the existence of petroleum there in quantities, operating as the Ebano Oil Company. Concessions had been secured on thousands of acres of land around Tampico and the plans matured for methodical development of the acreage. A narrow gauge railroad of about 75 miles had to be constructed, roads cut through the jungles, camps prepared for employes, tankage and pipe lines installed and a heavy investment risked before the actual production and sale of crude oil could be begun. For several years the railroads used every barrel of crude that could be delivered, but the wells declined until the contract could not be observed, as to quantity, even with the desultory drilling and little added production taken from a few neighboring properties. During 1910, however, the Doheny interests (which had reorganized, with three companies to handle the producing, the pipe line and the commercial end of the business—the Huasteca Oil Company, the Mexican Petroleum Company and another one) prospecting some miles in advance of the old development, struck two gushers that changed the whole situation in Mexico. One of these wells has been producing 25,000 bbls. a day, with a capacity of 30,000 bbls., and the other has been under control and producing 5,000 bbls. a day. A six-inch pipe line has just been laid from the wells to Tampico, where the Waters-Pierce Oil Company has a refinery, and 2,500,000 bbls. was contracted for to supply that plant. The capacity of the pipe line has been utilized since its completion to rush the crude to the refinery, and during February of this year an additional quantity, 3,500,000 bbls., was contracted for immediate delivery as desired.

The Huasteca and the Mexican Petroleum companies are rushing iron tanks and concrete storage reservoirs to completion, laying an eight-inch pipe line from the field to the City of Mexico and lines for convenient delivery to the railroad consumers, and increasing the work of developing the

production, all involving the expenditure of nearly $5,000,000 at once.

The English house of Pearsons, for many years government contractors and possessing the confidence of the Mexican government, hold concessions on several million acres of lands along the coast of Mexico from Tampico to the extreme southeastern point of Mexico, and have been for three years testing the territory in many places, with very indifferent success until quite recently, when a phenomenal gusher was struck west of Tuxpam and about 75 miles southwest of Tampico. Estimates of this well vary from 35,000 to 125,000 bbls. a day, with 40,000 bbls. a day as a safe estimate, and safely under control until the output can be handled. The Pearsons also have other wells in the same neighborhood that show good and they feel secure now in being able to produce enough oil for their trade demands, which are heavy and increasing. Their Minatitlan refining plant, which cost $2,000,000, will soon be in regular operation, wharves, tankage and pipe line connection having been provided at Tuxpam, the nearest oil-field port to the Minatitlan refinery. The Pearsons also constructed a narrow gauge railroad and a six-inch pipe line from Furbero, 47 miles southwest of Tuxpam, to that port to handle what at that time appeared to be a good production, but which since has not met expectations. The Pearson investment in petroleum enterprises in Mexico has undoubtedly exceeded that of the Doheny interests, but with an assured production it will become a very profitable one.

The Waters-Pierce Oil Company, with a refinery at Tampico and an auxiliary one at Vera Cruz, now being added to, has been the principal marketer of refined oils in Mexico for many years, importing crude from the United States. Its contract with the Mexican Petroleum Company for 5,000,000 bbls. of crude enables it to handle its trade much more satisfactorily. The Waters-Pierce people last year began development work on their own lands and have been making an aggressive campaign to increase their business, especially since the Pearsons entered the refined market. For a time the competition was something fierce, but prices are now on a more reasonable basis.

The Producers Oil Company recently took over a 10,000-acre perpetual lease on the Panuco river, 15 miles west of Tampico, with three producing wells, two of them producing about 600 bbls. each. This property is located between the old Ebano development on the north and the Pearson holdings on the south, the famous Dos Bocas geyser being southwest of Tampico.

On January 1, 1911, 29 companies had registered with the government to operate in the Tampico district, American, English and German, and the list is being added to rapidly, as the knowledge of the possibilities in Mexico extends. The Harriman railroad interests have made extensive investments, as the East Coast Oil Company, along the east coast of Mexico, and are doing considerable prospect and development work, with several producing wells completed.

Within a month Timothy Spellacy and California associates, including Admiral Robely D. Evans, have organized a company to operate in Mexico, incorporated with $2,000,000 capital, taking over, through the promotion of the Lincoln Mortgage and Loan Company, 30,000 acres leased by Tim and Pete Spellacy, William Wallace and J. D. Thompson.

The organizations of the Doheny interests, with their heavy capitalization and promising holdings, seem to be just now the strongest producing concern in Mexico and is in fine shape to realize, with their railroad and refinery contracts and pipe line system. For several years this company has operated an asphalt plant that is quite profitable, besides having a fine revenue from the agricultural and grazing revenues derived from its extensive holdings. Even as early as 1907 and 1908 dividends aggregating $65,000 to $85,000 a month were accumulating, but not disbursed until the close of 1910, in a lump.

The Mexican oil fields, as at present known and worked, follow the coast of the Gulf of Mexico at a fairly uniform distance from the coast, and all included in the State of Vera Cruz, from Tampico, on the north, to Tuxpam and Vera Cruz, on the south, although the Pearsons have done some drilling in the States of Tabasco and Chiapas, across to Tehuantepec, several hundred miles southeast of Vera Cruz and the developed or known fields. Showings have been obtained, but the best information is that they were not encouraging, although such a great area could not be condemned by a few tests. Some attempts have recently been made to prospect in Campeche, the western division of the big peninsula of Yucatan and Central America, across the gulf east and northeast of Vera Cruz.

Latest development gives the preference to the territory west of Tuxpam, from the Casiano to the Huasteca and Potrero del Llano sections, as locally known, as all the gushers have so far been discovered in that region, embracing an area 50 miles north and south, lying back from the gulf shore line along the headwaters of the streams flowing into the Gulf of Mexico. The Dos Bocas well, started by the Pennsylvania Oil Company in 1908, at Geronimo, 55 miles southwest of Tampico, blew in on the morning of July 4, 1908. The latest Pearson gusher is about 20 miles northwest of Tuxpam and about the same distance a little west of south of the Dos Bocas location. From the Mexican Petroleum Company's two great wells at Casiano and Cerro Azul, to the Furbero wells, 47 miles southwest of Tuxpam is about 100 miles, now fairly well outlined as producing territory.

At this time, including the Mexican Petroleum wells northwest and west of Tampico and at Casiano, the Pearson gusher and two other wells for the same people on the sand and ready to drill in, in the same formation as the big fellow, the Producers' Oil Company's production west of Tampico, and the Furbero field, not counted very strong now, Mexico can undoubtedly run into tanks today about 100,000 bbls. of crude a day, where a year ago 7,000 bbls. a day would have cleaned up everything, and not the best of crude at that. This gives some idea of the possibilities of that country, little known, hard to get into, difficult to get located in, and without transportation facilities, although enough pipe lines are either under way or about to start that will soon permit active drilling and handling of a big production. The crude is of very low gravity, a great deal of it at least, but the last few wells are showing a better grade of oil, with a profitable per cent of valuable products, which three refineries and two asphalt plants are anxious to take, and two of the refineries—the Water-Pierce plant at Tampico and the Pearson plant at Minatitlan—are modern and have large capacity. Located so close to the Gulf of Mexico the output of the Mexican fields will find easy transportation to outside fuel oil markets if the home markets are glutted.

In conclusion it is pertinent for The Journal to state that ere this issue has reached all its widely distributed destinations, the editor will be in Mexico (the insurrectos permitting and Deo volente), for the purpose of gathering specific information about the fields, the wells, the production, the facilities and the opportunities, for the exclusive benefit of readers of The Oil and Gas Journal. It had been his intention to make the trip earlier and prepare the data for this annual statistical number, but the work accumulated so fast that he was needed at home. Mexico is a very interesting oil field just at this time and every one in the petroleum industry, in all producing regions, is anxious to have some definite information, either as possible investors in producing territory, or as consumers of crude oil, or as manufacturers of oil field supplies, or merely because they are anxious to know if the world's production is to be further increased to the embarrassment of a steady or rising market. We will endeavor to procure information that will be interesting and instructive to every branch of the industry.

ALABAMA DEVELOPMENT.

Alabama first attracted attention in 1910, as a possible gas field more than as oil territory, by the completion of a number of gas wells in Fayette county, along the western line of the state, about 70 miles west of Birmingham. The producing formation, at about 1,400 feet, shows in shales, so closely connected with all the oil and gas fields of the country, and several of the wells show a volume of 4,000,000 cubic feet. A number of Pennsylvania people have become interested in leases for early development and a piping and distributing company has been organized to supply Birmingham and several Alabama towns and Columbus and adjacent towns in Mississippi. Prospecting is either begun or soon will be over quite an area, extending south from Fayette county and south and west into Mississippi. The fact that practical oil and gas interests have become interested there adds to the possibilities.

AMENDMENTS

To the Regulations of April 20, 1908, Governing Leasing of Lands of Members of the Five Civilized Tribes, in Oklahoma—Effective May 1, 1911.

Sections 1, 16, 22 and 23 of the regulations approved April 20, 1908, are hereby amended to read as follows:

1. Oil and gas leases requiring the approval of the Secretary of the Interior may be made for a period of ten years from the date of the approval thereof by the Secretary of the Interior, and as much longer thereafter as oil or gas is found in paying quantities. All leases shall be executed upon forms prescribed by the Department.

16a. Oil and gas leases shall contain the following provision in lieu of that portion of paragraph 2 of the lease form approved April 20, 1908, which relates to the mining of gas and the payment of royalties thereon:

And the lessee shall pay as royalty on each gas-producing well $300 per annum in advance, to be calculated from the date of commencement of utilization; provided, however, in the case of gas wells of small volume, when the rock pressure is 100 pounds or less, the parties hereto may, subject to the approval of the Secretary of the Interior, agree upon a royalty which will become effective as a part of this lease; provided, further, that in cases of gas wells of small volume, or where the wells produce both oil and gas or oil and gas and salt water to such an extent that the gas is unfit for ordinary domestic purpose, or where the gas from any well is desired for temporary use in connection with drilling and pumping operations on adjacent or nearby tracts, the lessee shall have the option of paying royalties upon such gas wells of the same percentage of the gross proceeds from the sale of gas from such wells as is paid under this lease for royalty in oil. The lessor shall have the free use of gas for domestic purposes in his residence on the leased premises, provided there be surplus gas produced on said premises over and above enough to fully operate the same. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas producing privileges the lessee shall pay a rental of one hundred dollars per annum in advance, calculated from date of discovery of gas, on each gas-producing well, gas from which is not marketed or not utilized other than for operations under this lease. Payments of annual gas royalties shall be made within twenty-five days from the date such royalties become due, other royalty payments to be made monthly on or before the 25th day of the month succeeding that for which such payment is to be made, supported by sworn statements.

b. The capacity of wells shall be ascertained, under the supervision of the Secretary of the Interior, when necessary under the terms of the lease to determine the amount of royalty to be collected.

c. Except in cases of emergency, which shall not exceed ten days, not more than 75 per cent of the capacity of any gas well shall be utilized.

d. Evidence of date of discovery of gas wells and the beginning of utilization must be promptly furnished by the lessee in the form of a sworn statement.

22. In oil and gas leases until a producing well is completed on leased premises and in all other mineral leases advance royalty shall be paid annually in advance from the date of approval of the lease, as follows: 15 cents per acre per annum for the first and second years; 30 cents per acre per annum for the third and fourth years; 75 cents per acre for the fifth year, and on oil and gas lease one dollar per acre for each succeeding year; and in the case of mineral leases other than for oil and gas, 75 cents per acre annually after the fifth year; the sums thus paid to be credited on the stipulated royalties. The advance royalty for the first year shall be tendered at the time of the filing of the lease in the office of the United States Indian Superintendent at Union Agency, Muskogee, Okla. On all mineral leases other than for oil and gas, when the annual advance royalty becomes due on a leased tract from which minerals are being produced, the lessee will not be required to pay the advance royalty until the royalty on production during the month within which the advance royalty falls due is accounted for; and if royalty on production equals or exceeds the advance royalty, it will be accepted as covering both items, but if it does not equal the advance royalty due, the lessee shall include the difference with his payment on production.

25. An oil and gas lessee shall drill at least one well on leasehold within twelve months from the date of the approval of the lease by the Secretary of the Interior, or may delay drilling said well for not exceeding ten years from the date of such approval by paying the United States Indian Superintendent, Union Agency, Muskogee, Oklahoma, for the use and benefit of lessor (subject to the limitations and conditions in said lease contained), in addition to said advance royalty the sum of $1 per acre, per annum, for each year the completion of such well is delayed, payable on or before the end of each year. The lessee may be required by the Secretary of the Interior, or by such officer as he may designate for the purpose, to drill and operate wells to offset wells on adjoining tracts and within 300 feet of the dividing line, or in case of gas wells the lessee may have the option of paying on each proposed well a sum equal to the royalty payable on the well to be offset instead of drilling such offset well. Offset wells must be drilled or royalty paid in lieu of drilling within 10 days after the lessee is notified to do so, and failure to comply with such requirement shall constitute a violation of one of the substantial terms of the lease.

Appropriate changes will be made in the lease form to provide for and carry into effect the provisions of the above modified regulations, and such modifications of the regulations and lease form shall be effective May 1, 1911, and may, at the option of the parties, be incorporated in leases hereafter executed prior to that date. Said modified provisions may also be substituted in any lease, executed prior to said date on forms now or heretofore in use, in lieu of corresponding provisions contained in such leases, upon formal stipulations by the parties to that effect, when duly approved by the Secretary of the Interior. All leases which embrace the said provisions, whether of original form or by substitution, shall be subject to these regulations.

These regulations shall not be construed as intended to affect existing approved leases, except where such leases are modified by stipulation, as provided herein, or where such leases are susceptible of modification in these respects by regulation.

(Signed) F. H. ABBOTT,

Assistant Commissioner of Indian Affairs.

Department of the Interior, Washington, D. C., February 6, 1911.

Approved:

(Signed) FRANK PIERCE,
First Assistant Secretary.

The Sugar Creek Oil and Gas Company is seeking a franchise from Navarre, O., which, it is understood, will be granted on terms proposed.

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PITTSBURG STOCK MARKET.

PITTSBURG, PA., Feb. 25.—(Special.)—With a holiday, the trading in natural gas and oil shares shows less than 6,000 shares during the week past.

Union Natural Gas, while not registering a trade, is a trifle softer, being offered at $135 with $130 bid.

Wichita Natural is offered at $43½, and no trades. It is reported that one of the large holders in this company has recently sold his interest.

Fayette Natural remains unchanged; $95 bid, offered at $105.

There are some offerings of Quapaw bonds with stock bonus around par and interest. It is reported the earnings of the company are encouraging, sufficient to take care of all charges, the sinking fund, and leaving something for the stock.

The Philadelphia Company registered the first sale in many months—30 shares at $53.

In Pittsburg Oil and Gas there were no trades; offered at $5.

Manufacturers Light and Heat about held its own, sales of 1,300 shares being made, ranging from $21½ to $21; closing offer at $21⅛ bid. The annual statement now in the hands of the stockholders, shows an increase in sales and gross receipts, but a decrease in net earnings of $68,000. In depreciation a little over $800,000 was charged off against $1,622,000 last year. The surplus increased $1,192,293.12 for the year, making the present surplus $2,224,950.44. Accounts receivable show an increase of $1,300,000, reflecting the sale of the company's leases to the Hope Natural Gas Company.

Ohio Fuel Supply closed a little softer, sales of 325 shares ranging from $43 to $42½; final bid $41; offered at $43. The debenture 6s were firm, all trades being at $97, with sales of $14,000.

Ohio Fuel Oil was practically unchanged, sales of 240 shares at $5¾; closing bid, $5⅝; offered at $5¾. This company has a production close to 1,500 bbls. per day of white-sand oil, with plenty of drilling territory to maintain it.

Kansas Natural registered one sale of 90 shares at $24½, is a little firmer and no stock pressing. Closed at $24¼ bid; offered at $24⅞.

Oklahoma Natural, while not active, having only one sale of 20 shares at $56—a point below its high mark—seems strong and buying orders would easily advance the market above $60. Closed at $52 bid; offered at $56.

Pure Oil, common, has been unusually active, having sales of 2,500 shares at $5, and is firmer than for some weeks. Closing at $4¾ bid; offered at $5. The preferred sympathized with the common, although no trades were made, $95½ was bid; offered at $98.

JO., JR.

BARNSDALL TO BUY WICHITA.

PITTSBURG, Feb. 28.—(Special.)—For several days rumors have been afloat, based on newspaper reports, that T. N. Barnsdall has purchased a controlling interest in the Wichita Natural Gas Company. When something of a tangible nature as to the truth of the reports that had been published were run down, it was learned from an authoritative source that the reports circulated are premature.

It can be stated to a certainty that Mr. Barnsdall has secured an option on a controlling interest, amounting to about two-thirds of the stock of the company. The time limit of the option does not expire till about April 1, and there are a lot of details to be worked out relative to a consummation of the purchase before that time.

The Wichita Natural Gas Company is capitalized at $3,000,000, and if the deal goes through will be a valuable acquisition to other Barnsdall interests, among them the Kansas Natural Gas Company and the Quawpaw Natural Gas Company, all operating in the Mid-Continent field.

The option on Mr. Barnsdall's oil interest in the Mid-Continent fields, said to be held by a foreign syndicate, will not expire till April 1. It is the consensus of opinion that the big deal will go through.

M. L. & H. ELECTION.

PITTSBURG, Pa., Feb. 28.—(Special.)—The officials and a large representation of the stockholders of the Manufacturers Light and Heat Company convened at the company's offices in the Columbiana Bank Building this morning, it being the occasion of the company's annual meeting, to hear the report for the past year and elect directors for the ensuing year. After the calling of the meeting to order by L. A. Meyran, first vice-president, the room being inadequate to accommodate the large attendance, adjournment was taken to the Monongahela House. John W. Donnan, of Washington, Pa., was elected to succeed James Kuntz, Jr., and P. C. Beers, of Oil City, was elected to succeed Henry I. Beers on the board of directors. A. E. Succop and J. I. Buchanan were elected to succeed themselves on the same board. The new board of directors will meet in a few days to elect officers for the ensuing year.

The meeting was very harmonious. The proposition to issue $8,500,000 in new bonds to take up those falling due and pay off the company's indebtedness, completely refinancing the company, was referred to. This plan had previously received the endorsement of the directors. A circular setting forth in detail the plan proposed will be mailed to each of the stockholders about the 10th of March, and will be voted on and accepted or rejected on March 29, when a meeting will be called for that purpose.

The report of General Manager T. O. Sullivan says, in part:

"During the year 108 wells were drilled, 9 of which were disposed of before being completed; there were productive of gas, 61; productive of oil, 14, and 24 dry holes. Of the productive gas wells, 28 were drilled deep, 33 shallow; productive oil wells, 12 were drilled deep, 2 shallow; dry holes, 7 drilled deep and 17 shallow. During the year we sold 20 gas wells, including the 9 wells mentioned above; abandoned 71 gas and 9 oil wells, making a total of 100 wells sold and abandoned. Number of wells in operation December 31, 1910, 1,003 gas wells, 275 oil wells, or total of 1,278 productive wells, and eight wells drilling.

"During the year we lifted in the field 31.23 miles of pipe and laid 39.18 miles, increasing the amount of pipe in the field 7.95 miles, making a total of 1,629.95 miles of all sizes of pipe in field lines. From this, however, must be deducted 33.69 miles pipe lines which was disposed of during the year, under agreement with the Hope Natural Gas Company, leaving a total of 1,596.26 miles in use December 31, 1910. In low pressure or city lines, we lifted 2.01 miles and laid 40.2 miles, making a total of 38.19 miles of new lines laid. Total number of miles of low pressure lines being operated December 31, 1910, 663.19 miles.

"The company now holds under lease 366,022.39 acres of gas and oil territory situate in Pennsylvania, Ohio and West Virginia, of which 109,888.05 acres are operated and 256,134.34 acres are held in reserve for future operations. During the year we disposed of 80,663.24 acres of territory by sale to other companies, and surrendered 37,199.60 acres, making in all 117,862.84 acres sold and abandoned. 65,171.24 acres of this territory is covered by our agreement with the Hope Natural Gas Company; a large portion of the balance was situated a long distance from our present pipe lines system and some of it was located in the immediate vicinity of dry holes, so that none of it seemed to be desirable territory for this company to hold.

"The total number of consumers of gas and water is 76,740, being an increase during the year of 3,132. Of the above number 66,317 are domestic consumers of natural gas.

"During the year we discontinued the manufacture of illuminating gas and abandoned the plant at Sewickley, Pa., it having been found unprofitable to longer continue the operation of this plant. The electric light plant, located at Sewickley, Pa., was also disposed of.

"The production of oil for the year averaged 442.78 bbls. per day, being a decrease of 2.42 bbls. per day compared with the production of the previous year.

"During the year 1910 the gas compressing stations, which were in process of construction, have all been completed, and have given very satisfactory service during the present season. We found it unnecessary, during the present winter, to operate a number of our older steam stations in the Pennsylvania field. Our stations are now all in good condition, and we do not anticipate any expense from this end of the business, outside of ordinary repairs, for some time to come."

TRI-COUNTY PLANS.

The Tri-County Natural Gas Company has let the contract to the Hope Engineering Company, of Pittsburg, of which W. H. Hammon is president, for the construction of about 60 miles of pipe line in Clarion, Forest and Elk counties, to connect the wells of the company with distributing points. About 4,000 tons of pipe, ranging in size from 2 to 6 inches for field and from 8 to 10 inches for main pipe lines, will be required. The total expenditure will approximate $500,000, including the cost of a compressor plant. The contract was aggressively sought, more than 40 bidders participating, as it is the largest of its kind placed in the Pittsburg district during past year.

The Dayton Pipe Coupling Company will furnish the couplings and pipe comes from the Mark Manufacturing Company of Zanesville, O.

The Tri-County Natural Gas Company was incorporated in April, 1910, and has leaseholds on 20,000 acres of gas territory in the above counties. The territory has been thoroughly tested and developed, 85 producing wells have been drilled, having an open-flow production of fully 30,000,000 feet per day. Seven sands have been found, the principal production being in the third, fourth, Speechly and Bradford sands. The lower sands have never been drawn upon and have their original rock pressure. Approximately 100,000 acres of gas lands are available in this district. The main pipe line will follow the anti-clinal along which the development lies. Production is found over an area 12 miles wide and 20 miles long. Several markets are available for the product, such as Oil City and Franklin on the south and Warren, Kane and Mount Jewett on the north, while a number of large manufacturing plants are negotiating for supplies. The company expects to market its gas within 90 days from beginning of construction, and contract is to be completed within six months.

The compressor station will consist of 7 300-horse-power engines, of which the Alberger Gas Engine Company of Buffalo will supply five and the Miller Gas Engine Company of same city the other two. The plant will be rope-driven and the compressor will be installed by the Hall Steam Pump Company of north side. The plant is somewhat novel in design, and, in winter, will be heated by exhaust gas from main engines in compressor station, instead of by steam-heat from an auxiliary plant as is usual. George T. Ladd of the George T. Ladd Company, the consulting engineer, declares that pipe line and equipment will be modern and efficient in every respect.

The company has a capital of $1,200,000 and has sold an issue of $600,000 of 6 per cent bonds. A sinking fund of $50,000 per annum, beginning November 1, 1912, is provided for. The officers are: H. Prentiss Taylor, president; James Scott, vice-president; Charles A. Lawrence, secretary and treasurer, and J. C. McDowell, general manager. The directors are: James Scott, H. Prentiss Taylor, T. A. Gillespie, A. B. Cohn, Kane, Pa.; R. W. Shorts, Leeper, Pa.; George B. Luper, Meadville, Pa.; George T. Ladd and H. S. Glenn. Mr. Glenn, the new member of the board, was one of the partners of Trees & Benedum in their Louisiana oil properties.

FOREIGN GAS FIELDS.

Natural gas is receiving attention in foreign fields. In Austria, some 40 miles from Budapest, a large gas well was completed last year by the government and a commission was sent to the United States to study natural gas last June.

Near the Roumania oil field a German company has several good gas wells and is figuring on utilizing the gas in supplying nearby towns.

November last the government in drilling for water near Hamburg, struck gas at 810 feet and the pictures show a very respectable gas well, good for 5,000,000 to 15,000,000 cubic feet.

In England a company has been formed to prospect for gas in Sussex county.

South America has several gas wells showing commercial quantities.

All of the above show that North America has no monopoly on natural gas.

GAS IN LATIN AMERICAN CITIES.

Consul General Bartleman reports that gas in Buenos Aires costs 8 cents per cubic meter (about $2.40 American gold per 1,000 cubic feet) for lighting, and one-half that price for power purposes.

Vice Consul General Guyant writes that the new gas factory at Mexico City charges 5 cents gold per cubic meter, with a discount of 10 per cent to the average consumer and further discounts to large consumers until the lowest net rate reaches 3 cents per cubic meter (about 90 cents per 1,000 cubic feet). The gas is made from the abundant crude oil in Mexico.

Consul General Dietrich states that the gas company at Guayaquil, Ecuador, charges 20 cents silver per cubic meter (about $3 American gold per 1,000 cubic feet), plus 40 cents silver (about 20 cents gold) for rental of meter, and the internal-revenue stamps required to be affixed to all bills, receipts, etc. The gas company has a capital of $150,000 gold, with a $75,000 reserve fund, and in 1909 paid a dividend of 15 per cent, passed $15,000 gold to its reserve fund, and distributed $3,500 among its employes as a gratuity.

NORTH DAKOTA AND OREGON.

Bulletin No. 431-A contains an account of the natural gas region of North Dakota, by A. G. Leonard, and a brief report on gas prospects in the Harney valley, Oregon, by C. W. Washburne. The Oregon prospects are from 90 to 105 miles southwest of promising prospects near Vale, also described by Mr. Washburne, and the gas appears to be derived from the same geologic formation, but the field has not yet been much developed.

North Dakota Prospects Good.

Most of the North Dakota prospects are in Bottineau and Lamoure counties. Gas is piped to Westhope, in Bottineau county, for domestic use from wells near the town. The gas sells at 30 to 40 cents a thousand feet. It has almost no odor and gives an excellent light.

Deep Drilling in Bottineau County.

Drilling to the Dakota sandstone, the probable source of the gas, is now under way in Bottineau county. The gas from the wells in Lamoure county comes from this formation. In most of the developed prospects the gas is of good quality and appears to be present in quantity sufficient to make it commercially important.

The Jackson Center (O.) Gas and Oil Company has been incorporated for $2,500, by L. M. Babcock and associates.

The Clarion Oil Company, of Houston, Tex., has been incorporated for $5,000, by J. C. and W. T. McKallip and John Hamman.

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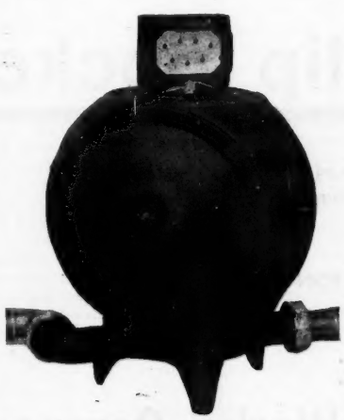

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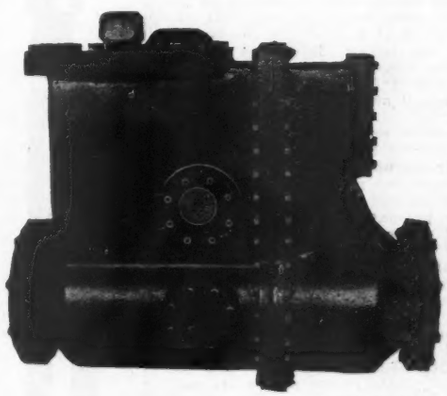

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(Oil Investors' Journal)

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Illinois, 30 degrees and above	.60
Illinois, under 30 degrees	.52
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The above prophecy, made by an old time lover of the gas engine, is being literally fulfilled in the recent developments of the modern oil engine. The application and use of steam alone, up to the present time, has more than trebled man's working power, but the advent of high prices is causing an economic movement to sweep over the country and all power users ars demanding cheaper operating power units.

We are commencing to realize that 95% of the energy stored in the locomotive's coal is being wasted, and that our best steam power plants are taking a dollar's worth of fuel in exchange for 15 cents worth of energy.

Resorting to the gasoline engine we saved about 25% of the money paid for fuel; but the present and prospective high price of gasoline limits the universal adoption of the gasoline engine for power purposes—in fact, the relative prices of fuel are such that steam is a close competitor of gasoline even on small units.

About ten per cent of crude petroleum is available as gasoline. Viewing the matter in this light the gasoline engine is more wasteful than the steam engine, because it only gives back 25% of 10% which is 2½%. Now the problem is to get an engine that is capable of satisfactory operation on the 90% of the petroleum that is left after taking off the gasoline. At the present time large portions of this 90% are available at from 2 to 3 cents per gallon, the same being sold under the names of gas oil, solar oil, and domestic fuel oil, all essentially the same. A gallon of the fuel oil contains approximately the same amount of energy as does a gallon of gasoline.

The St. Marys Machine Co., of St. Marys, Ohio, after months of patient experimenting and expensive trials, have perfected and are now putting on the market an engine which economically and satisfactorily operates on the low grade oil above mentioned. This engine divides the usual cost of operation by four. Where fuel bills were once one dollar they are now twenty-five cents.

The engine is designed to start on gasoline as an ordinary gasoline engine. Duplicate fuel oil valves and gasoline valves are so arranged that after a five-minute run on gasoline the supply is changed to a one to five mixture of gasoline and fuel oil; after a further run of ten minutes the gasoline is entirely shut off and the engine is run on the gas oil, or fuel oil, alone.

The oil is fed to the engine through an improved water jacketed exhaust-heated vaporizing governor and mixing valve, which is peculiarly designed to produce interrupted air currents of great velocity whose whirling action causes momentary partial vacuums, breaking up the oil particles into the finest spray, which condition is so necessary to perfect combustion and economy.

One of the unique features of this improved engine is that it governs on both fuel and air, measuring out just the proper amount of air and oil for each change of load. This feature, coupled with the fact the engine is neatly and properly proportioned, well balanced, and may be changed instantly from gasoline to oil while under full load, makes it one of the most practical, economical and easily managed power units which modern engine factories have produced.

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